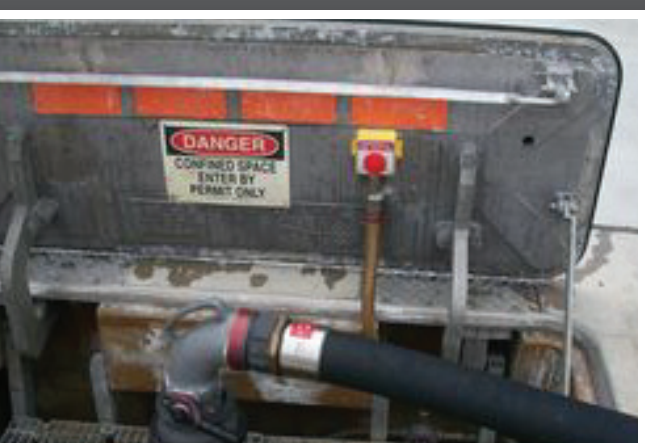
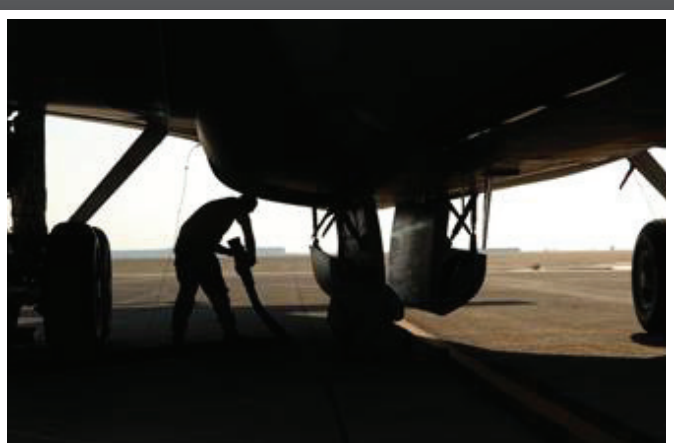
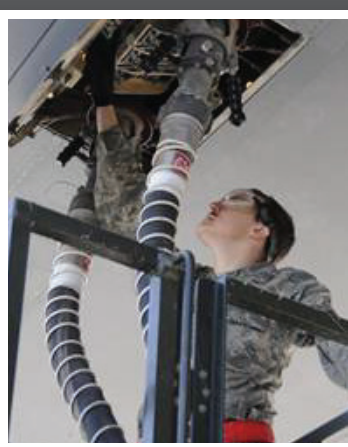
U.S. Air Force
Environmental Assessment
Add To and Alter Type III Hydrant Fueling System
Tinker Air Force Base, Oklahoma

United States Air Force
Air Force Materiel Command



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14. ABSTRACT

The 72 ABW is proposing to replace the Type III hydrant fueling system that supports 552nd Air Control Wing (552 ACW), 76th Maintenance Wing (76 MXW), and transient aircraft serviced north of the taxiways at Tinker AFB. The purpose of the Proposed Action is to efficiently provide and convey clean, dry fuel to all fueling points in support of 552 ACW, 76 MXW and transient aircraft assigned to Tinker AFB. The Proposed Action is needed to provide a reliable Type III hydrant fueling system to fuel the 552 ACW E-3 and other depot aircraft in an efficient and environmentally responsible manner. The Proposed Action is needed to  Comply with Section 3.3.2.1 of Air Force Handbook 32-1084 (Facility Requirements) that necessitates a hydrant fueling system for aircraft with a total tank capacity exceeding 76,000 liters (20,000 gallons). The 552 ACW is the only combat organization that does not have the capability to fuel a majority of its aircraft with a hydrant system.  Reduce the amount of time needed for fueling and defueling of aircraft at Tinker AFB.  Eliminate congestion during the fueling and defueling process at the existing hydrant fueling area The Proposed Action to replace the Type III hydrant fueling system at Tinker AFB was evaluated in this EA. Environmental resources evaluated in this impact analysis are: air quality cultural resources; geologic resources and soils, hazardous wastes and materials; and water resources (floodplains and wetlands).

15. SUBJECT TERMS

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FINDING OF NO SIGNIFICANT IMPACT AND FINDING OF NO PRACTICABLE ALTERNATIVE ADD TO AND ALTER TYPE III HYDRANT FUELING SYSTEM TINKER AIR FORCE BASE, OKLAHOMA

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), Title 40 of the Code of Federal Regulations (CFR), §§1500-1508; Air Force Environmental Impact Analysis Process (EIAP) regulations 32 CFR §989 and Department of Defense Directive 6050.1, the Air Force has prepared an environmental assessment (EA) to identify and evaluate the potential impacts on the natural and human environment associated with the replacement and expansion of the Type III hydrant fueling system at Tinker Air Force Base (AFB), Oklahoma.

Purpose and Need for the Proposed Action (EA §1.2)

The 72_{nd} Air Base Wing (72 ABW) of the Air Force, under command of Headquarters Air Force Materiel Command (AFMC), is proposing to replace and expand the Type III hydrant fueling system that supports 552_{nd} Air Control Wing (552 ACW), 76_{th} Maintenance Wing (76 MXW), and transient aircraft serviced north of the taxiways at Tinker AFB. The purpose and need of the Proposed Action is to efficiently provide and convey clean, dry fuel to all fueling points in support of 552 ACW, 76 MXW, and transient aircraft assigned to Tinker AFB. In order for an alternative to be carried forward for further analysis, it needed to:

- Comply with §3.3.2.1 of Air Force Handbook 32-1084 (*Facility Requirements*) that necessitates a hydrant fueling system for aircraft with a total tank capacity exceeding 76,000 liters (20,000 gallons). The 552 ACW is the only combat organization that does not have the capability to fuel a majority of its aircraft with a hydrant system.
- Reduce the amount of time needed for fueling and defueling of aircraft at Tinker AFB.
- Eliminate congestion during the fueling and defueling process at the existing hydrant fueling area.

Description of Proposed Action and Alternatives

The Air Force proposes to replace and expand the functionally limited existing Type III hydrant fueling system with a Type III hydrant fueling system that would serve 23 aircraft parking positions. The proposed replacement of the Type III hydrant fueling system would be located at the existing fueling area north of the taxiways. The Proposed Action would result in:

- Installation of ten additional fuel hydrant outlets and associated facilities including secondary containment.
- Replacement of 13 of the 18 existing fuel hydrant outlets to include secondary containment.
- Replacement of the manual product recovery system with an automatic system.
- Refurbishment of the surge suppressor pit, fuel dispensing looped system, and spill containment at the hydrant service vehicle checkout stands. Piping would be replaced.
- Refurbishment of two existing, operational 10,000 barrel JP-8 fuel storage tanks.

- Demolition of ramp pavement and three existing buildings and supporting structures northwest of the hydrant fueling area: the pump station (Facility 486); Control Room (Facility 487); and the oil-water separator (Facility 488).
- Construction of a new Type III pump house as a completely enclosed metal structure.
- Installation of a new 500 kiloWatt (kW) emergency generator to replace the existing 500 kW generator.

Construction of the project would require approximately 12 months. Aircraft fueling and defueling operations on the apron would continue during the construction period.

Preferred Alternative (EA §2.9)

Based on the analyses conducted for this EA, the Air Force has identified the Proposed Action (replacement of the Type III hydrant fueling system as described in §2.3 of the EA) as the Agency Preferred Alternative.

No Action Alternative (EA §2.4)

Under the No Action Alternative, the Air Force would continue to service 552 ACW, 76 MXW, and transient aircraft using the existing Type III hydrant fueling system and refueler trucks. The existing system contains six hydrants on the Airborne Warning and Control System (AWACS) Ramp and seven hydrants on the Military Airlift Command (MAC) Ramp. The use of fuel trucks to support planned operations would increase air pollutant emissions and risk of spills to surface waters.

Environmental Consequences

Air Quality (EA §3.1.5)

Emissions from demolition and construction activities would be negligible and impacts would be short-term. Standard dust minimization practices, such as watering construction areas would further reduce emissions of particulate matter equal to or less than 10 microns in diameter (PM_{10}), lessening impacts on local air quality. Construction emissions would not cause or contribute to a violation of any national, state, or local ambient air quality standard, nor would they expose sensitive receptors to substantially increased pollutant concentrations. Operational air pollutant emissions from the implementation of the Proposed Action would be less than the current air pollutant emissions from the existing hydrant fueling system (i.e., elimination of fuel vapors released from refueler trucks). The Proposed Action would result in long-term beneficial operational impacts on air quality through a net reduction of air pollutant emissions.

Cultural Resources (EA §3.2.4)

Although no known historic properties are within or immediately adjacent to the project area, construction has the potential to encounter an unanticipated discovery of subsurface archaeological material due to the need for ground disturbance (i.e., excavation and trenching). To avoid impacts to archaeological resources, the Air Force would ensure any archaeological deposits discovered during construction activities would be managed in accordance with the compliance procedures in the Tinker AFB Integrated Cultural Resources Management Plan (ICRMP). The State Historic Preservation Officer concurred with this finding on 18 Nov 11 (EA Appendix A). The Air Force consulted with Native American tribes and groups within the area and no issues or concerns with cultural resources have been identified to date.

Geologic Resources and Soils (EA §3.3.4)

Construction of the replacement of the Type III hydrant fueling system would occur within an area where the physiographic features and geologic resources have been previously disturbed. Alteration of ground surface would consist of pavement removal and trenching to install new fuel hydrants and piping. Demolition and construction would not require any permanent removal of topsoil or the need for extensive fill. The hydrant system would be designed and constructed in accordance with engineering standards applicable to soil characteristics at the project site. Earthwork would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Best management practices such as single point construction entries would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion. No permanent alteration of surface features would occur. Impacts to geologic resources and soils would not be significant.

Hazardous Materials and Wastes (EA §3.4.4)

Regulated waste such as asbestos containing materials, lead-based paint, polychlorinated biphenyls (PCB), and mercury would be contained and disposed in accordance with all applicable standards by a licensed contractor. Compliance with applicable requirements would result in negligible impacts from exposure to hazardous substances during demolition of existing facilities and construction of the new facilities.

Because soil and groundwater contamination from past fuel releases is present in the project area, any contaminated soil from trenching or excavation would be tested prior to disposal. Ongoing cleanup and investigation at nearby contaminated sites would continue during construction of the Proposed Action.

Operation of the replacement Type III hydrant fueling system would not result in the generation or disposal of hazardous materials or wastes. The likelihood of spills from the transfer of fuel using refueler trucks would be eliminated when the new hydrant fueling system is operational. Ongoing remediation and investigation at nearby contaminated sites would not be impeded during the use and operation of the new hydrant fueling system. Therefore, there would be no adverse impacts on or from hazardous materials or wastes, or contaminated sites during operation of the Proposed Action.

Water Resources (EA §3.5.4)

The Proposed Action would be constructed to avoid disturbance to Kuhlman Creek. Best Management Practices for erosion control would be followed in accordance with construction permit conditions and the Storm Water Pollution Prevention Plan (SWPPP). No change to groundwater recharge would occur as a result of the Proposed Action.

- **Wetlands.** There are no wetlands in the area of the Proposed Action that would be affected by construction or operations.
- **Floodplains.** Demolition of Buildings 486, 487, and 488, construction of a new pump house, and trenching to install replacement piping for the new pump house would occur within the floodplain associated with Kuhlman Creek, an intermittent stream. The proposed replacement of these structures would not result in any change in the elevation, function, or capacity of the existing floodplain, since activities would only involve short-term construction and installation of underground fuel piping. Following installation, the

piping would be buried and the ground surface would be returned to its current condition (i.e., elevation, topography, and ground cover). The Proposed Action would have temporary negligible impacts on the Kuhlman Creek floodplain in the 480 Tanks Area; no permanent impacts would occur.

For these reasons, the Proposed Action would not result in impacts to water resources.

Cumulative Impacts (EA §§3.1.7, 3.2.5, 3.3.5, 3.4.5, and 3.5.5)

The cumulative impacts of implementing the Proposed Action along with other past, present and future projects identified in §2.5 of the EA were assessed.

- It is not expected air pollutant emissions, when added to emissions from one or more of the reasonably foreseeable concurrent actions, would exceed ambient air quality standards or expose sensitive receptors to substantially increased pollutant concentrations. Operational emissions generated by the Proposed Action would be less than existing emissions.
- No historic buildings would be affected by the Proposed Action and the probability is low for inadvertent discoveries of archaeological resources.
- The in-kind replacement of existing structures would not result in any adverse impacts to geologic resources or soils. No permanent removal of topsoil, alteration of topography or increases in erosion would result.
- The likelihood of fuel spills from the transfer of fuel using refueler trucks would decrease. The potential for truck-related fuel spills would be eliminated when the new hydrant fueling system is operational.
- The Proposed Action would not result in any disturbance to surface water, groundwater, and wetlands or alteration of floodplains.

Therefore, the Proposed Action would not contribute to cumulative impacts on air quality, cultural resources, geologic resources and soils, hazardous materials and wastes, or water resources (surface water, groundwater, wetlands or floodplains).

Public Notice

A Notice of Availability for public review of the Draft EA was published in *The Daily Oklahoman* and *Tinker Take Off* on 10 November 2011. The document was sent to 25 agencies and organizations and also made available for review at the Midwest City Public Library. The public review lasted 30 days. Two comment letters were received: the Association of Central Oklahoma Governments confirmed the project is not inconsistent with area-wide goals and objectives; and the state of Oklahoma Water Resources Board recommended the local floodplain administrator be contacted for possible permit requirements for floodplain development. Prior to beginning construction, the Air Force will obtain a Floodplain Development Permit from the Federal Emergency Management Agency for work in the 100-year floodplain. No negative comments were received by the Air Force.

FINDING OF NO PRACTICABLE ALTERNATIVE

Taking the above information into consideration, pursuant to Executive Order 11988 (*Floodplain Management*) and the authority delegated by Secretary of the Air Force Order 791.1, I find that there is no practicable alternative to conducting the Proposed Action within the floodplain and the Proposed Action includes all practicable measures to minimize harm to the environment. This finding fulfills both the requirements of the referenced Executive Order and the Air Force EIAP regulation, 32 CFR §989.14, for a Finding of No Practicable Alternative.

FINDING OF NO SIGNIFICANT IMPACT

Based upon my review of the facts and analyses contained in the attached EA and as summarized above, I find the Proposed Action to replace and expand the Type III hydrant fueling system at Tinker AFB will not have a significant impact on the natural or human environment; therefore, an environmental impact statement is not required. This analysis fulfills the requirements of NEPA, the President's Council on Environmental Quality 40 CFR §§1500-1508 and the Air Force EIAP regulations 32 CFR §989.

22 Dec 2011

PAUL A. PARKER, SES
Command Civil Engineer
Communications, Installations
and Mission Support

Date

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U.S. AIR FORCE
ENVIRONMENTAL ASSESSMENT

ADD TO AND ALTER TYPE III HYDRANT FUELING SYSTEM
TINKER AIR FORCE BASE, OKLAHOMA

United States Air Force
Air Force Materiel Command

Tinker Air Force Base, Oklahoma

December 2011

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ENVIRONMENTAL ASSESSMENT
ADD TO AND ALTER TYPE III HYDRANT FUELING SYSTEM
AT TINKER AIR FORCE BASE, OKLAHOMA

Responsible Agency: Department of the Air Force, 72nd Air Base Wing (72 ABW), Civil Engineering Flight, Tinker Air Force Base (AFB), Oklahoma

Proposed Action: Add to and Alter Type III Hydrant Fueling System at Tinker AFB, Oklahoma

Written comments and inquiries regarding this document should be directed to: Mr. Brion Ockenfels, 72 ABW/PA, 7460 Arnold Avenue (Bldg 460), Suite 127, Tinker AFB, Oklahoma 74135 Phone: (405) 739-2027. email: brion.ockenfels@tinker.af.mil

Abstract: The 72 ABW is proposing to replace the Type III hydrant fueling system that supports 552nd Air Control Wing (552 ACW), 76th Maintenance Wing (76 MXW), and transient aircraft serviced north of the taxiways at Tinker AFB. The purpose of the Proposed Action is to efficiently provide and convey clean, dry fuel to all fueling points in support of 552 ACW, 76 MXW and transient aircraft assigned to Tinker AFB. The Proposed Action is needed to provide a reliable Type III hydrant fueling system to fuel the 552 ACW E-3 and other depot aircraft in an efficient and environmentally responsible manner. The Proposed Action is needed to:

- Comply with Section 3.3.2.1 of Air Force Handbook 32-1084 (*Facility Requirements*) that necessitates a hydrant fueling system for aircraft with a total tank capacity exceeding 76,000 liters (20,000 gallons). The 552 ACW is the only combat organization that does not have the capability to fuel a majority of its aircraft with a hydrant system.
- Reduce the amount of time needed for fueling and defueling of aircraft at Tinker AFB.
- Eliminate congestion during the fueling and defueling process at the existing hydrant fueling area

The Proposed Action to replace the Type III hydrant fueling system at Tinker AFB was evaluated in this EA. Environmental resources evaluated in this impact analysis are: air quality; cultural resources; geologic resources and soils, hazardous wastes and materials; and water resources (floodplains and wetlands).

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APPENDICES

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ACRONYMS AND ABBREVIATIONS

ABW	Air Base Wing
ACOG	Association of Central Oklahoma Governments
ACW	Air Control Wing
AFB	Air Force Base
AFCEE	Air Force Center for Engineering and the Environment
AFGLSC	Air Force Global Logistics Support Center
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AP	accumulation point
APE	area of potential effect
APZ	Accident Potential Zone
AQCR	air quality control region
ARW	Air Refueling Wing
AST	aboveground storage tank
ATFP	anti-terrorism/force protection
AWACS	Airborne Warning and Control System
BACT	best available control technology
BBL	barrel
BMP	best management practice
B.S.	Bachelor of Science
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CCG	Combat Communications Wing
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CG	contaminated groundwater
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CRP	Compliance Restoration Program
CSCW-1	Command Strategic Communications Wing One
CZ	Clear Zone
DEQ	Department of Environmental Quality
DISA	Defense Information Systems Agency
DoD	Department of Defense
EA	environmental assessment
ECAMP	Environmental Compliance Assessment and Management Program
EIAP	environmental impact analysis process
EIG	Engineering Installation Group
EIS	environmental impact statement

E.O.	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESQD	Explosive Safety Quantity Distance
FONPA	finding of no practicable alternative
FONSI	finding of no significant impact
FRG	Foundation Repair Guide
GHG	greenhouse gases
GIS	Geographic Information System
GISP	Geographic Information System Professional
GWMU	groundwater management unit
GWP	global warming potential
HAP	hazardous air pollutant
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
HQ AFCEE	Headquarters, Air Force Center for Engineering and the Environment
HMMP	Hazardous Materials Management Plan
HMMS	Hazardous Materials Management System
ICA	Intergovernmental Coordination Act
ICE	internal combustion engine
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IRP	Installation Restoration Program
JP-8	Jet Propellant 8
JP-5	Jet Propellant 5
kPa	kilo Pascal
kW	kiloWatt
LBP	lead-based paint
LRS/LGRFO	Logistics Readiness Squadron/Fuels Management
MAC	Military Airlift Command
M.A.G.	Master of Applied Geography
MILHDBK	military handbook
MM	Modified Mercalli
MMRP	Military Munitions Response Program
$\mu g/m^3$	micrograms per cubic meter
MMRP	Military Munitions Response Program
M.S.	Master of Science
MSL	mean sea level
MXW	Maintenance Wing
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NATO	North Atlantic Treaty Organization
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act

N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	ozone
OAS	Oklahoma Archaeological Survey
OC-ALC	Oklahoma City-Air Logistics Center
OC-ALC/GK	Oklahoma City-Air Logistics Center/Aerospace Sustainment Directorate
OCC	Oklahoma Corporation Commission
ODWC	Oklahoma Department of Wildlife Conservation
OK	Oklahoma
OT	other
PA	Public Affairs
P2	pollution prevention
PCB	polychlorinated biphenyl
PFC	perfluorocarbon
P.L.	Public Law
PM_{10}	particulate matter equal to or less than 10 microns in aerodynamic diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in aerodynamic diameter
ppm	parts per million
PSD	prevention of significant deterioration
psi	pounds per square inch
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
RW	radioactive
SCAQMD	South Coast Air Quality Management District
SCMG	Supply Chain Management Wing
SES	Senior Executive Service
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SRM	Sustainment, Repair and Modernization
ST	storage tank
SWPPP	Storm Water Pollution Prevention Plan
TACX	Tinker Aerospace Complex
TCE	trichloroethene
tpy	ton(s) per year
TSDF	treatment, storage and disposal facility
USACE	United States Army Corps of Engineers
USAF	United States Air Force
UFC	Unified Facilities Criteria
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
VOC	volatile organic compounds

CHAPTER 1
OVERVIEW

The United States Air Force (USAF), Air Force Materiel Command (AFMC), 72nd Airbase Wing (72 ABW) at Tinker Air Force Base (AFB), Oklahoma (the Responsible Agency for this Environmental Assessment and the proponent for this action) proposes to replace and expand the Type III hydrant fueling system that supports the 552nd Air Control Wing (552 ACW), 76th Maintenance Wing (76 MXW), and transient aircraft serviced north of the taxiways at Tinker AFB, Oklahoma.

1.1 INTRODUCTION

Tinker AFB currently utilizes a Type III hydrant fueling system to fuel and defuel multiple aircraft assigned to 552 ACW. The main types of aircraft serviced include the E-3 Sentry used for the USAF Airborne Warning and Control System (AWACS) and the C-5 and C-17 cargo aircraft used by 76 MXW and other units. All these aircraft have a total tank capacity exceeding 76,000 liters (20,000 gallons) and are required to be supported by a hydrant fueling system per Section 3.3.2.1 of Air Force Handbook 32-1084 (*Facility Requirements*).

The 72nd Logistics Readiness Squadron (72 LRS), part of the Air Base Wing, conducts an average of 268 fueling and 28 defueling of E-3 and other depot aircraft using both hydrants and fuel trucks each month. There are a total of 18 hydrants used to fuel and defuel aircraft: six (6) hydrants on the AWACS ramp; and twelve (12) hydrants on the Military Airlift Command (MAC) ramp. Because the number of aircraft needed to be refueled and defueled exceeds the number of hydrants available, 72 LRS supplements using R-11 refueler trucks. Fueling aircraft by truck takes one hour or 3 man hours longer than fueling with a hydrant while defueling takes 2.5 hours (10 man hours) longer than defueling with a hydrant.

Tinker AFB has 14 refueler trucks capable of defueling aircraft. Tinker AFB conducts defueling operations by using one truck based on mission demands. On an average day, defueling of aircraft occurs because of operational, weather and maintenance factors (i.e., the aircraft must not have any fuel in its tank during maintenance). An average of 60,000 pounds of fuel is offloaded for each aircraft defueling.

Due to substantial increases in the 552 ACW operations tempo and associated programmed training, the current aircraft fueling system at Tinker AFB is not functioning in an optimal manner. Lack of additional hydrant locations to support the increasing number of aircraft have resulted in Tinker AFB relying on heavier use of truck to refuel and defuel aircraft, which result in delays of up to three hours and interfere with maintenance times. This results in an inability to respond to mission requirements in accordance with sortie schedules and is now affecting mission performance and readiness of the 552 ACW.

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to provide a reliable fueling system for 552 ACW, 76 MXW and transient aircraft at Tinker AFB. The fueling system is needed to:

- Comply with Section 3.3.2.1 of Air Force Handbook 32-1084 (*Facility Requirements*) that necessitates a hydrant fueling system for aircraft with a total tank capacity exceeding

76,000 liters (20,000 gallons). The 552 ACW is the only combat organization that does not have the capability to fuel a majority of its aircraft with a hydrant system.

- Reduce the amount of time needed for fueling and defueling of aircraft at Tinker AFB.
- Eliminate congestion during the fueling and defueling process at the existing Type III hydrant fueling area.

The inefficient truck refuel/defuel situation has caused fueling delays of up to three hours interfering with maintenance time and sortie generation. This results in mission degradation and delayed maintenance for sortie generation. Sortie generation is complicated by the maintenance workarounds due to the fueling situation and negatively affects operational readiness.

The objective of this action is to improve the existing Type III hydrant fueling system to enable this operation to meet minimum standards for mission readiness, security, safety and environmental stewardship.

The transition to 100 percent hydrant fueling has the potential to increase aircraft maintenance personnel availability by 1,600 hours annually. The added fuel hydrant capacity will eliminate fuel truck hauls (2 miles per round trip) and their inherent hazards, thus reducing the energy and environmental footprint for the E-3 operations. Hydrant fueling will provide a minimal fuel spill impact by supplying a more controlled delivery system.

1.3 LOCATION, HISTORY AND CURRENT MISSION

1.3.1 Location

Tinker AFB is a major U.S. Air Force base, with Navy and other Department of Defense missions, located in the southeast Oklahoma City area, directly south of the suburb of Midwest City, Oklahoma (Figure 1-1). The main portion of Tinker AFB is located within the incorporated city limits of Oklahoma City, Oklahoma. Centered ten miles southeast of downtown, Tinker AFB is generally bordered to the north by Interstate 40 and 29th Street, to the east by Douglas Boulevard, to the south along 74th Street, and to the west by Sooner Road. Incorporated areas immediately surrounding the Base include Midwest City to the north and Del City to the northwest (Figure 1-2).

Figure 1-1. Location of Tinker Air Force Base, Oklahoma

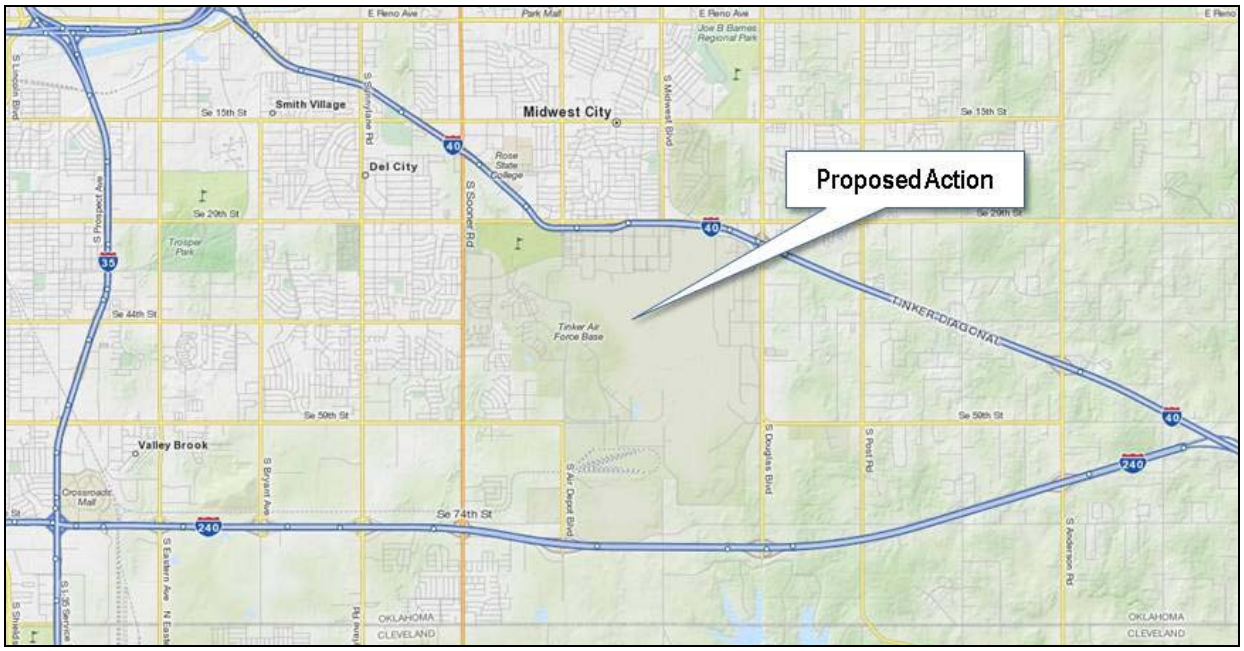

Figure 1-2. Location of the Proposed Action

Tinker AFB occupies 5,033 acres and is divided into seven districts:

- The Northside Industrial District is where the majority of administrative, command and control, 552 ACW and personnel services are located.
- The Eastside Depot Maintenance District encompasses the majority of the activities associated with the Oklahoma City - Air Logistics Center (OC-ALC).
- The 38th Engineering Installation Group (EIG) District is a satellite location east of the Base boundary.
- The Southeastside Munitions District is located in the isolated southeast corner of the Base for the storing of munitions.
- The South Forty District, which includes the 3rd Combat Communications Group (CCG), the 507th Air Refueling Wing (ARW), and the U.S. Navy Command Strategic Communications Wing One (CSCW-1), is located in the southwestern portion of the Base.
- The West Community District has housing and most community facilities.
- The Airfield District located in the center of the Base is comprised of runways, taxiways and areas that support aircraft operations and maintenance.

1.3.2 History of Tinker AFB

As the United States was preparing for World War II in the early 1940s, the military needed aircraft manufacturers to build massive quantities of aircraft and subsequently, to establish air bases and depots to support these aircraft. On May 21, 1941, with the support of the city government and local organizations, the Army selected 960 acres just east of Oklahoma City to establish a depot. The Oklahoma City Air Depot began operations in downtown Oklahoma City in January 1942. The airfield was ready for beneficial occupancy on March 1, 1942, and was named Tinker Field in late 1942. After the war, all facilities came under control of the military. In January 1948, the installation became Tinker Air Force Base (USAF, 2011b). The Douglas

Cargo Airplane Plant manufactured C-47s at Tinker AFB for the Army during World War II. After the end of WWII, the plant was closed and converted into new types of repair and test facilities, including facilities for testing and over-hauling jet engines by the base. During the Cold War, Tinker AFB became the logistics center for several of the key functions of the nation's new aircraft, missiles, and communications equipment, including the logistics functions of the B-52 bomber (USAF, 2011b).

A major repair site during the Korean War, the base was also the headquarters of the Combat Control Center during the Cuban Missile Crisis. During the Vietnam War, the base's size and responsibilities for aircraft and vehicle repair were again expanded. Tinker AFB was the only overhaul depot for the J-57 engine, and it provided overhaul and repair services for the F-101 engine, the AGM-86A missile, and other military offensive aircraft. In the early 1990s, the base provided front-line support to the forces engaged in Operation Desert Shield and Desert Storm. Today, Tinker AFB continues to provide aircraft maintenance and repair as well as logistical support (USAF, 2011b).

1.3.3 Mission

Tinker AFB is an AFMC installation. With 464 buildings, the installation functions as a major aircraft maintenance and repair depot. The largest organization on the Base is OC-ALC which is the largest of three depot repair centers in AFMC. OC-ALC provides depot maintenance, management expertise as well as installation, services and information support for weapon systems, commands, Air Force bases and foreign nations. The host organization for Tinker AFB is OC-ALC, whose mission is to provide aircraft modifications, repairs and program management on a variety of bombers, refuelers and reconnaissance aircraft.

OC-ALC is the worldwide manager for a wide range of aircraft engines, missiles and commodity items. The center manages an inventory of aircraft, which include the B-1 Lancer, B-2 Spirit, B-52 Stratofortress, C/KC-135 Stratotanker, E-3 Sentry and contractor logistics support aircraft; as well as a substantial jet engine inventory ranging from the older Pratt and Whitney TF33 to the newer, state-of-the-art engines such as the GE F118. The center performs depot maintenance and overhaul and repair on numerous jet engines. More than 17,763 military, civilian and contract employees work at OC-ALC. OC-ALC is comprised of three wings that collaborate to ensure the overall success of the center:

- The 72 ABW provides base installation and support services for the OC-ALC and 45 associate units assigned to six major commands, including 552 ACW (the largest flying wing in Air Combat Command), the Navy's Strategic Communications Wing One and several defense agencies. More than 1,600 personnel and 1,343 contractors work within the 72 ABW.
- The 76 MXW is the largest wing at the center with more than 8,400 military and civilian personnel. The 76 MXW performs programmed depot maintenance on the C/KC-135, B-1B, B-52 and E-3 aircraft, expanded phase maintenance on the Navy E-6 aircraft, and maintenance, repair and overhaul of F100, F101, F108, F110, F118, F119 and TF33 engines for the Air Force, Air Force Reserve, Air National Guard, Navy and foreign military sales. Additionally, the wing is responsible for the maintenance, repair and overhaul of a myriad of Air Force and Navy airborne accessory components, and the development and sustainment of a diverse portfolio of operational flight programs.

- The Oklahoma Air Logistics Center Aerospace Sustainment Directorate (OC-ALC/GK) organizes, directs and controls total life-cycle management of 94 B-52, 585 C/KC-135, 69 B-1 and 416 contractor logistics (including tanker, trainer, telemetry, airlift, command and control and U.S. Presidential aircraft) aircraft. This Directorate is also responsible for all modifications and sustainment, including management and engineering of systems upgrades, acquisition of new systems, fleet support logistics, software maintenance, and programmed depot maintenance and supporting USAF, Reserve and Guard, sister service and forces from numerous foreign military services. OC-ALC/GK manages the readiness of B-2 and E-3 aircraft, 1,382 Air Traffic Control and Landing Systems, and worldwide High Frequency Global Communications Network.

Tinker AFB is also home to eight major Department of Defense, Air Force and Navy activities with critical national defense missions:

- The 448th Supply Chain Management Wing is comprised of five Supply Chain Management Groups (SCMG): 448th SCMG Contracting Group; 638th SCMG Planning & Execution Group (Robins AFB, Georgia); 748th SCMG, Planning & Execution Group (Hill AFB, Utah); 848th SCMG Planning and Execution Group; and 948th SCMG Materiel Group. All are part of the Air Force Global Logistics Support Center (AFGLSC) headquartered at Scott AFB, Illinois.
- The 552 ACW flies the E-3 Sentry aircraft and is part of the Air Force's Air Combat Command mobile strike force.
- The U.S. Navy CSCW-1 provides a vital, secure communications link to the submerged fleet of ballistic missile submarines. OC-ALC airframe artisans perform depot work on the Navy's E-6 Mercury airplanes while sailors perform field-level work.
- The 507th ARW, an Air Force Reserve flying unit, supports U.S. military and North Atlantic Treaty Organization (NATO) aircraft with aerial refueling and Airborne Warning and Control System missions worldwide. OC-ALC is the primary source of depot maintenance for the wing's KC-135R aircraft and engines.
- The 3rd Combat Communications Group provides deployable communications, computer systems, navigational aids and air traffic control services anywhere in the world.
- The 38th Cyberspace Engineering Group has worldwide responsibility for engineering and installation of all communications and electronic facilities for the Air Force.
- The Defense Distribution Depot Oklahoma provides the receipt, storage, issue, inspection and shipment of material in support of OC-ALC and other Tinker-based organizations.
- The Defense Information Security Agency Defense Enterprise Computing Center, Oklahoma City, is the local organization of the Defense Information Systems Agency (DISA). DISA operates computer systems for the base and serves 172 other bases in all 50 states and 92 foreign countries (USAF, 2011a).

The 72 ABW, 552 ACW, U.S. Navy CSCW-1, and 507th ARW are assigned responsibility for the E-3 Sentry, the E-6B Mercury, and the KC-135. These organizations are capable of supporting and executing their global mission from the Tinker AFB. OC-ALC is responsible for depot level maintenance of the B-1B Lancer, the E-3 Sentry, B-52, C/KC-135, the E-6B Mercury, and 25 other Contractor Logistics Support aircraft. The center also oversees 23,000 aircraft engines, and a multitude of missile systems for the Department of Defense. The AWACS

mission supports a variety of taskings including Homeland Defense and generates over 1,600 sorties annually.

1.3.4 Tinker AFB Hydrant Fueling Area

The 552 ACW has 28 assigned E-3A aircraft based at Tinker AFB. The 72 LRS/LGRFO conducts fueling and defueling of 16 parked aircraft using six (6) existing hydrants on the AWACS ramp in conjunction with R-11 refueler trucks. The model 1863 truck is used to fuel the remaining parked aircraft without static hydrants (OC-ALC/FMC, 2011). The existing Type III hydrant fueling system for 552 ACW E-3 and other depot aircraft is located north of the runway on Tinker AFB (Figure 1-3).

1.4 SUMMARY OF ENVIRONMENTAL STUDY REQUIREMENTS

The National Environmental Policy Act (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences prior to undertaking federal actions that may affect the environment. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA. The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508) and 32 CFR 989, *Air Force Environmental Impact Analysis Process.*

Figure 1-3. 552 ACW Aircraft Fueling Area on Tinker AFB

These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The CEQ regulations require that an environmental assessment (EA):

- Briefly provide sufficient evidence and analysis to determine whether an environmental impact statement (EIS) or finding of no significant impact (FONSI) should be prepared;
- Aid in an agency's compliance with NEPA when no EIS is required; or,
- Facilitate preparation of an EIS, when required.

1.4.1 Scope of the Environmental Assessment

This EA identifies, describes, and evaluates the potential environmental impacts that may result from the Proposed Action and the No Action Alternative. The EA also explains the Alternatives Formulation and Consideration process in which other alternatives were considered but eliminated from consideration. As appropriate, the affected environment and environmental consequences of the Proposed Action will be described in terms of site-specific descriptions or a regional overview. Finally, the EA will identify measures that would prevent or minimize environmental impacts, if required.

1.4.2 Resource Areas Addressed in Detail

The intent of this EA is to meet NEPA requirements established in 32 CFR 989 (EIAP). The following resource areas are discussed in detail in the EA:

- Air Quality;
- Cultural Resources;
- Geologic Resources and Soils;
- Hazardous Materials and Wastes; and
- Water Resources (including surface and ground water, and floodplains).

1.4.3 Resource Areas Eliminated from Further Study

Resource areas that have been eliminated from further detailed study in this document and the rationale for eliminating them are presented in the following paragraphs:

- **Airspace Operations.** This action does not involve any change to the level of aircraft operations at Tinker AFB.
- **Biological Resources.** This action would require replacement of underground piping in between the existing control room/pump house area and taxiway. Trenching for utilities would occur in non-native grassland that is maintained turf grass and not high-value wildlife habitat. All other construction would be on paved, improved areas associated with the airfield. For this reason, the Proposed Action would not result in any impacts to biological resources at Tinker AFB or the surrounding community.
- **Land Use**. This action would represent a continuation of industrial activities in the aircraft fueling and defueling area north of the runways. The Proposed Action would not result in any change to existing or planned land use at Tinker AFB.
- **Noise.** With the exception of temporary construction-related noise that would be localized at the airfield, this action does not involve any change to the level of aircraft operations at Tinker AFB. For this reason, the Proposed Action would not result in any impacts to the noise environment at Tinker AFB or the surrounding community.
- **Safety**. Human health and safety are defined as the conditions, risks, and preventative measures associated with a facility and its ability to potentially affect the health and safety of facility personnel or the general public. The proposed replacement of the Type

III hydrant fueling system would primarily be an on-Base function with minimal impacts to the general public. While unmarked surface safety zones are present in the project area, the aircraft apron is not located in a Clear Zone (CZ), Accident Potential Zone (APZ), or within an Explosive Safety Quantity Distance (ESQD) area. The Proposed Action would decrease risks associated with the mishap potential and operational safety because the use of refueler trucks would be eliminated from routine operations. The replacement system would also include a new emergency power generator and upgrades to pumping and control systems. These features would enhance safety of the entire hydrant fueling system. The Proposed Action would result in beneficial impacts to occupational and system safety in the aircraft refueling area.

- **Sustainability**. On October 5, 2009, President Barack Obama issued Executive Order (E.O.) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, to expand upon energy reduction and environmental performance requirements of E.O. 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*, which was signed on January 24, 2007. E.O. 13514 establishes federal energy requirements in the areas of: accountability and transparency; strategic sustainability performance planning; greenhouse gas (GHG) management; sustainable buildings and communities; water efficiency; electronic products and services; fleet and transportation management; and pollution prevention and waste reduction. The Proposed Action to replace the existing Type III hydrant fueling operation that currently uses eleven R-11 refueler trucks with additional hydrants would provide an opportunity to improve efficiency in aircraft fueling operations on Tinker AFB. This action would contribute to the mandated energy reduction goals at Tinker AFB as defined by E.O. 13514 by reducing energy used by vehicles. As sustainability represents the reconciliation of social, environmental and economic demands, the Proposed Action would also result in a cost savings from elimination of the use and maintenance of refueler trucks in routine operations.
- **Solid Waste.** The Proposed Action would result in generation of construction and demolition (C&D) waste which is generally separated from other solid waste to facilitate disposal. C&D waste includes solid wastes resulting from the construction, demolition of buildings, and pavements (concrete and asphalt). Solid waste generated on Tinker AFB is disposed of at an off-base landfill. The nearest landfill to Tinker AFB is the Southeast Oklahoma City Landfill approximately 8 miles west of Tinker AFB. This landfill processed 535,809 tons of solid waste in 2010, has an expected lifespan of 12 years (Sanders, 2011), and is permitted to accept C&D waste. C&D waste is also accepted for recycling at other nearby off-base yards. C&D debris generated on Tinker AFB is not included in solid waste pickup but rather is processed separately from other solid waste generated at the base. The construction contractor will be required to comply with the Tinker AFB Integrated Solid Waste Management Plan that establishes procedures for managing solid waste on Tinker AFB, when applicable. Tinker AFB operates a Defense Reutilization and Marketing Office to accept materials for reuse, transfer, donation, or sale, as well as accepting recyclable materials such as scrap metal and automotive and aircraft tires (USAF, 2005). The Proposed Action would not result in generation of solid waste or C&D waste that would exceed the capacity of the off-base landfill or recycling facilities.

- **Socioeconomic Resources**. The Proposed Action would result in a temporary increase in local employment through construction jobs and local spending for construction materials; this impact would be beneficial but minor in comparison to the regional economy. The Proposed Action would result in loss of one permanent position associated with aircraft fueling and defueling activities. The Proposed Action would not result in any appreciable impacts to population, income, or economic activity at Tinker AFB or in the local area or region.
- **Visual Resources**. This action does not involve any permanent, physical modifications to aircraft fueling area that would result in substantial alteration of the visual appearance of this industrial area adjacent to the runways on Tinker AFB.
- **Infrastructure and Utilities**. The Proposed Action would not result in any change to communications, electricity, natural gas, potable water, or wastewater treatment.
- **Public Services.** This action does not involve any change to the level of aircraft operations or any substantial change in personnel requirements at Tinker AFB. For this reason, there would be no change in the need for police or fire protection, medical services or other public services.
- **Environmental Justice and Protection of Children.** In 1994, President William J. Clinton issued Executive Order (E.O.) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, in response to growing concern that minority and low-income populations bear adverse health and environmental effects disproportionately. E.O. 12898 encourages federal facilities to achieve "environmental justice" by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Accompanying E.O. 12898 was a Presidential transmittal memorandum, which referenced existing federal statutes and regulations to be used in conjunction with E.O. 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA, specifically that, "Each federal agency shall analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC Section 4321, et seq." In 1997, E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was issued by President William J. Clinton. This order requires a similar analysis for children, where federal agencies must identify and assess environmental health risks and safety risks that may disproportionately affect children. Environmental health risks or safety risks refer to risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as air, food, drinking water, recreational water, and soil).

  Oklahoma County exhibits a higher minority population (48.7 percent) than the state of Oklahoma (32.0 percent). The county is composed of a higher percentage of persons under 18 years of age (26.2 percent) than the state (24.9 percent). The county is characterized by the same percent of low-income persons (16.2) as the state. Although Oklahoma County has a disproportionately higher percentage of minorities and children, the area that would be affected by the Proposed Action is limited to on-Base property. Based on the analyses conducted for this EA, the Proposed Action does not result in

significant or adverse effects at any location for the following resources: air quality; cultural resources; geological resources and soils; hazardous materials and wastes; and water resources. Since the Proposed Action would not have any adverse effect, no disproportionately high or adverse impacts upon minority and low-income populations would be anticipated. Therefore, impacts on environmental justice would not occur. Likewise, the Proposed Action would not cause environmental health or safety risks that may disproportionately affect children.

1.4.4 Interagency and Intergovernmental Coordination for Environmental Planning

Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). The AFI implements the following:

- Air Force Planning Document 32-70, *Environmental Quality*;
- Department of Defense (DoD) Directive 4165.61, Intergovernmental coordination of DoD Federal Development Programs and Activities;
- Executive Order 12372, Intergovernmental Review of Federal Programs;
- Title IV of the Intergovernmental Coordination Act (ICA) of 1968; and
- Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

Section 401(b) of the ICA states that, "All viewpoints-national, regional, state, and local…will be fully considered…when planning federal or federally assisted development programs and projects."

1.4.5 Required Permits and Consultations

The following federal, state, or local permits, licenses, and consultation requirements are required before implementation of the Proposed Action:

- The Air Force will provide notification of construction to the Federal Aviation Administration (FAA) on Form 7460-1, Notice of Proposed Construction or Alteration, in accordance with 14 CFR 77.9, *Safe, Efficient Use, and Preservation of the Navigable Airspace.*
- Clean Water Act – Regulates water quality by establishing standards and facilitating permit programs. The Proposed Action would require a Stormwater General Permit for Construction Activities (Permit No. OKR10) from the state of Oklahoma Department of Environmental Quality (DEQ).
- U.S. Army Corps of Engineers Clean Water Act Section 404 Nationwide Permit 12 – Utility Line Activities – activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the loss of greater than ½ acre of waters of the U.S.
- National Historic Preservation Act (NHPA) consultation with the Oklahoma State Historic Preservation Officer (SHPO) and the Oklahoma Archaeological Survey (OAS) on a determination of No Effect (the Proposed Action would not result in the removal or disturbance of any National Register of Historic Places (NRHP)-eligible buildings or structures nor would any ground disturbing activities result in any effects on the historic district on Tinker AFB.

- Notification to the Oklahoma DEQ to confirm that the proposed construction would not require further permit action under the existing Tinker AFB Title V Permit No. 2009-394-TVR.
- Floodplain Development Permit from the Federal Emergency Management Agency for work in the 100-year floodplain.

Section 10 of the Rivers and Harbors Act approved March 3, 1899, (33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. Construction of any structure in or over any navigable water of the United States, the excavating from or depositing of material in such waters, or any other work affecting the course, location, condition, or capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. The instrument of authorization is designated a permit. The Proposed Action would not require a Section 10 Permit from the Corps of Engineers.

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CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the elements associated with development of alternatives that were considered by the Air Force. The specifics of the proposal for meeting the project's purpose and need are discussed for each alternative. The methodology used to identify alternatives and the alternatives considered but not carried forward for analysis are provided in Subchapter 2.1. This chapter also describes the No Action Alternative in accordance with Council of Environmental Quality (CEQ) regulations (40 CFR 1502.14[d]). Elements of the Proposed Action are described in Subchapter 2.3.

2.1 INTRODUCTION

The current aircraft fueling system at Tinker AFB is currently not functioning in an optimal manner. Inefficient truck refueling and defueling is resulting in delays of up to three hours which, in turn, interferes with maintenance time. This results in inability to respond to mission requirements in accordance with sortie schedules. Implementation of the Proposed Action is needed to provide a reliable Type III fueling system to fuel 552 ACW, 76 MXW and transient aircraft at Tinker AFB in a timely and environmentally responsible manner. The Proposed Action is needed to efficiently provide and convey clean, dry fuel to all fueling points in support of the 552 ACW aircraft assigned to Tinker AFB. As required by NEPA, the potential impacts of the Proposed Action on the human and natural environment must be evaluated, and reasonable alternatives to the Proposed Action must be considered.

2.2 ALTERNATIVES SELECTION STANDARDS

To meet the objectives of this action, each alternative had to meet minimum standards for mission readiness, proximity to existing facilities, and facility standards:

- **Mission Readiness.** Maintenance and operation schedules must be efficient to enable fueling and defueling with turnaround times that support mission capability and readiness. Schedules must demonstrate the ability to refuel or defuel aircraft needed for training and combat sortie generation rates. If these fueling rates are not met, aircraft sortie generation capacity will rapidly degrade eventually causing a mission failure to meet a global tasking.
- **Proximity to Existing Aircraft Maintenance and Operational Facilities.** The selected alternative must be within reasonable distance to the existing airfield, hangars and infrastructure that supports the aircraft fueling and defueling operations.
- **Facility Standards.** The selected alternative must comply with Air Force Handbook 32-1084 and Unified Facilities Criteria (UFC) 03-460-01 (*Design: Petroleum Fuel Facilities*).

2.2.1 Alternatives Considered

Personnel from the 72 ABW and 552 ACW reviewed options to efficiently provide and convey clean, dry fuel to all fueling points in support of the 552 ACW, 76 MXW and transient aircraft at Tinker AFB. As a result of the process and, in addition to the No Action Alternative, 72 ABW

and 552 ACW personnel identified four alternatives to satisfy the need identified in Subchapter 1.2:

- **Increase Number of Refueler Trucks.** The use of additional refueler trucks to perform refueling and defueling of aircraft assigned to 552 ACW, 76 MXW and other units was considered. This option would be constrained by the number of fuel hydrants and would not reduce turnaround time for each fueling or defueling operation. Use of additional trucks would result in generation of additional air pollutant emissions and increase the risk of surface spills. This alternative would result in an increase in security requirements associated with the additional number of refueler trucks and personnel on the flightline, would not provide a realistic solution to the need for increased efficiency in the fueling area, and is not considered as a viable alternative.
- **Alternate Fueling Location.** The use of an alternate airfield area on Tinker AFB for the fueling and defueling of aircraft assigned to 552 ACW, 76 MXW and other units was also considered. At this time, there are no available alternative fueling areas with sufficient infrastructure (i.e., fuel tanks and hydrants) to support 552 ACW assigned aircraft. Other fueling locations on Tinker AFB are under the control of other Department of Defense organizations and are fully utilized with no spare capacity. Use of other industrial areas adjacent to the airfield could compromise missions of tenant units on Tinker AFB.
- **Additional Personnel.** The Air Force considered assigning additional personnel to the fueling and refueling operation. This option would be constrained by the lack of equipment and fuel hydrants. This alternative does not provide a realistic solution to the need for increased efficiency in the fueling area. Thus, use of additional personnel to meet fueling requirements was not considered as a viable alternative.
- **Replace Type III Hydrant Fueling System.** The Air Force considered replacing the existing Type III hydrant fueling system to enable 100 percent hydrant fueling that would reduce the use of refueler trucks and hours required per fueling or defueling operation.

Table 2-1 summarizes the selection process. "Yes" indicates the alternative would meet the standard or that the alternative would represent an acceptable solution. As indicated in Subchapter 2.1.1, an alternative must meet three selection standards to be considered viable.

Table 2-1. Application of Selection Standards to Alternatives Considered

Selection Standards	Alternative			
	Increase Number of Refueler Trucks	Alternate Fueling Location on Tinker AFB	Additional Personnel	Replace Type III Hydrant Fueling System
Mission Readiness	No	No	No	Yes
Proximity to Existing Aircraft Maintenance and Operational Facilities	No	No	Yes	Yes
Facility Standards	No	Yes	Yes	Yes
Eliminated from Further Consideration	Yes	Yes	Yes	No

2.2.2 Alternatives Eliminated from Further Consideration

As shown in Table 2-1, only the proposed replacement of the Type III hydrant fueling system would meet all three selection standards. Neither of the other alternatives considered would enable the Air Force to meet its fueling and defueling requirements. Based on the summary in

Table 2-1, the proposed replacement of the Type III hydrant fueling system was identified as the alternative best suited to meet the need identified in Subchapter 1.1. Therefore, the following three alternatives have been eliminated from further review:

- Increase Number of Refueler Trucks
- Alternate Fueling Location on Tinker AFB
- Additional Personnel

2.3 DESCRIPTION OF THE PROPOSED ACTION

The Air Force proposes to replace and expand the functionally limited existing Type III hydrant fueling system with a Type III hydrant fueling system that would serve twenty-three (23) aircraft parking positions. The Type III hydrant fueling system provides constant fuel pressure throughout the system and allows for multiple aircraft to be refueled without a reduction in the performance of the fueling pumps. In older systems, the system pressure would degrade if multiple aircraft were being refueled.

The proposed replacement of the Type III hydrant fueling system would be located at the existing fueling area north of the taxiways. The project location includes the existing aircraft apron north of the runways, two operational JP-8 fuel storage tanks, control room, pump house and pumping station northwest of the apron (Figure 2-1). The area containing the two JP-8 fuel storage tanks, control room, pump house and pumping station are collectively referred to as the "480 Tanks Area". The type of functions to occur at this location would be consistent with existing and planned installation land use as indicated in the Base General Plan.

The Proposed Action would result in:

- Installation of ten (10) additional fuel hydrant outlets and associated facilities. Each hydrant will be provided with secondary containment in accordance with requirements established in 40 CFR 280.11.
- Replacement of 13 of the 18 existing fuel hydrant outlets. Each existing/refurbished hydrant outlet will be provided with secondary containment.
- Replacement of the manual product recovery system with an automatic system.
- Refurbishment of the surge suppressor pit, fuel dispensing looped system, and spill containment at the hydrant service vehicle checkout stands. Piping would be replaced.
- Design and construction of the Type III hydrant fueling system would conform to UFC 03-460-01 (*Design: Petroleum Fuel Facilities*). Future strategic fuels storage and handling capabilities would be accommodated by the design of the hydrant system.

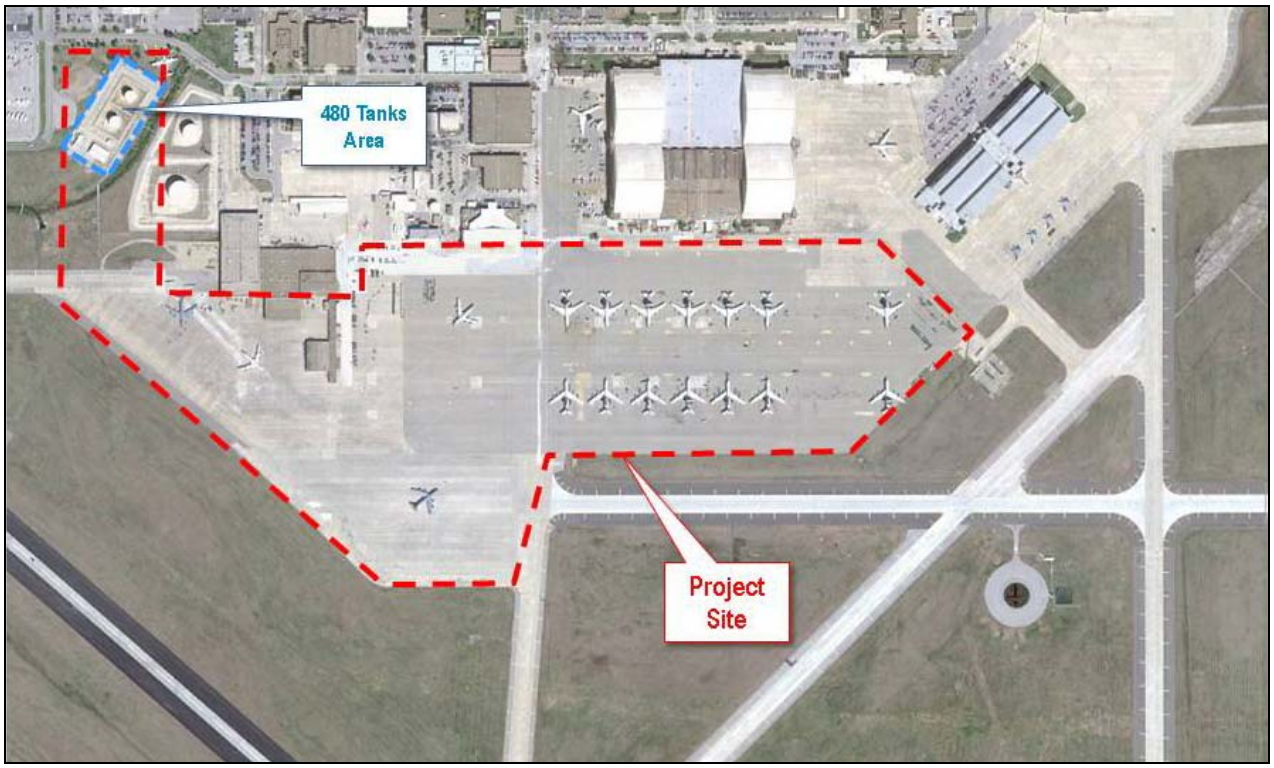

Figure 2-1. Site Layout for Replacement of Type III Hydrant Fueling System

The Proposed Action would also result in construction in the 480 Tanks Area (Figure 2-2) as follows:

- Refurbishment of two (2) existing, operational 10,000 barrel (BBL) JP-8 fuel storage tanks to include replacement of bottom seals and tank gauges. A floating pan would be added to one of the tanks (the other tank already has a floating pan).
- Demolition of ramp pavement and three existing buildings and supporting structures northwest of the hydrant fueling area; the Control Room (Facility 487); the oil-water separator (Facility 488); and pump station (Facility 486).
- Construction of a new Type III pump house as a completely enclosed metal structure to include five (5) fuel pumps and filter separators rated at 600 gallons per minute (gpm), product recovery system, control system, surge suppressor pit, stainless steel issue piping, coated carbon steel return piping, motor control and programmable logic controls center, automatic start switchgear, and utilities per DoD Standard Design for Type III Pressurized Aircraft Fuel Systems.
- The area would be graded to a finished elevation that would be above the 100-year floodplain. Secondary containment and other spill control measures will be provided in accordance with applicable regulations.
- Installation of a new 500 kiloWatt (kW) emergency generator to replace the existing 500 kW generator which supports two systems (the fuel hydrant system and the bulk fuel system). The new generator would conform to UFC 03-460-01 (which complies with the applicable provisions of 40 CFR 280.11 (*Interim Provision for Deferred UST Systems*) and the emergency power capability requirements in AFI 23-201 (*Fuels Management*).

Construction of the project would require approximately 12 months. The anticipated maximum depth of excavation required would be 8 ft below ground surface. Aircraft fueling and defueling operations on the apron would continue during the construction period.

This project would meet all criteria and scope specified in MIL-HDBK 1022A and Section 3.3.2.1 of Air Force Handbook 32-1084 (*Facility Requirements*). The project, although industrial in nature, would be required to meet all requirements, guidelines, direction, compatibility, and brand name justifications identified in the current version of the Tinker AFB Facility Standards when the design process is initiated. These design criteria would be incorporated into the design.

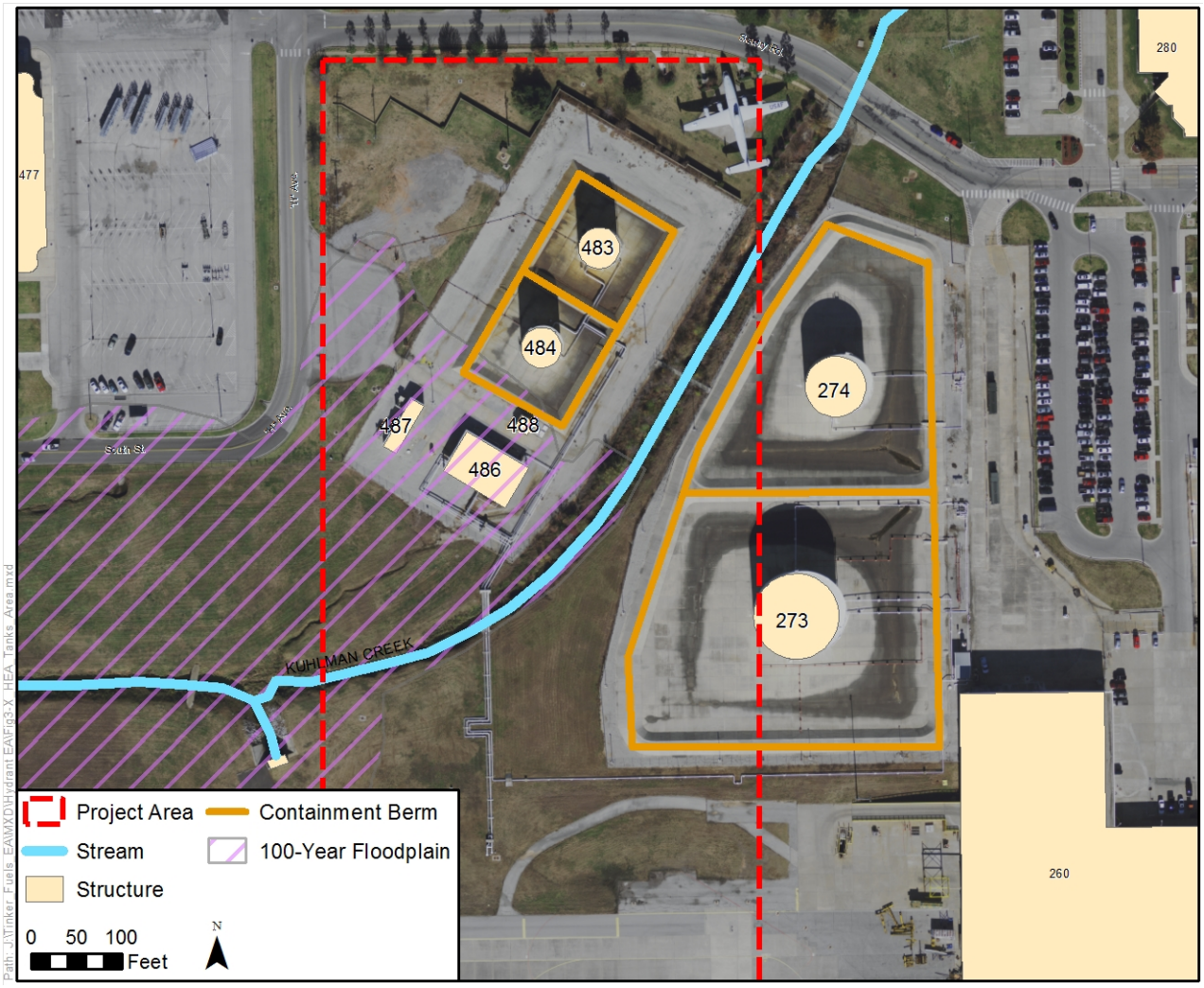

Figure 2-2. Proposed Construction in the 480 Tanks Area

Replacement of the Type III hydrant fueling system would be conducted in cooperation with 72 ABW/CEPR and AFCEE to ensure efficiencies can be achieved in conjunction with ongoing remedial actions in the area of the Proposed Action. This coordination and communication would avoid conflicts with ongoing investigative and remedial actions in the project area. The proposed construction may encounter contaminated soil associated with several Installation Restoration Program (IRP) sites. In the event contaminated soil is encountered, proper testing and disposal of removed contaminated material will be required. The Proposed Action would not include remediation of contaminated soil that may be encountered during trenching or

excavation. A separate Sustainment, Repair and Modernization (SRM) project will fund containment, removal and remediation efforts for this project.

The proposed construction will meet Anti-Terrorism/Force Protection (AFTP) criteria, as coordinated with 72 ABW/XP-AT.

The Type III hydrant system will be designed in accordance with UFC 03-460-01, *Design: Petroleum Fuel Facilities* (August 2010). Section 2-14 of UFC 03-460-01, Environmental Protection, requires compliance with the National Environmental Policy Act and applicable regulations of the EPA, Coast Guard and Department of Transportation, including 40 CFR 280.11.

All contract specifications for construction projects on Tinker Air Force Base include a section on environmental requirements. Section 00 72 00 (*Environmental Requirements for Construction Contracts*) will specify environmental protection and compliance requirements before and during construction for management of storm water (including erosion control), wastewater, hazardous materials, hazardous wastes (including asbestos, lead-based paint, polychlorinated biphenyls and others), natural resources, cultural resources, air emissions, occupational health and safety, and compliance with applicable Executive Orders and federal, state, Air Force, and Tinker AFB regulations. Lead-based paint (LBP) would be managed in accordance with the Tinker AFB LBP Management Plan.

2.4 NO ACTION ALTERNATIVE

The Air Force is required by regulation to consider the No Action Alternative. Under the No Action Alternative, operations would continue using the existing aircraft fueling system which contains six (6) hydrants on the AWACS Ramp and seven (7) hydrants on the MAC Ramp. Maintenance and operational schedules will continue to be interrupted because of inefficient truck refuel/defuel operations. Inadequate turnaround times are currently impacting mission capability and readiness. Required aircraft maintenance is delayed due to a lack of adequate fueling hydrants resulting in less aircraft available for sortie generation stretching the E-3's mission response capability. It is critical these hydrants are installed to provide for the faster turnaround time associated with servicing of 552 ACW, 76 MXW and transient aircraft.

2.5 REASONABLY FORESEEABLE CONCURRENT ACTIONS

A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The complete EIAP of the No Action Alternative and the Proposed Action must consider cumulative impacts due to other actions.

Implementation of the Proposed Action and associated potential environmental impacts would occur concurrently with other projects and developments proposed on Tinker AFB in the vicinity of the proposed Type III hydrant fueling system that would be replaced. In addition to the Proposed Action, there are 24 known projects occurring or planned on Tinker AFB within the next three years.

Projects Currently Under Construction:

- Depot Maintenance, Reengineering, and Transformation of Three-Bay Multi-Aircraft Hangar Construction
- Medical Clinic Construction
- 507th Base Realignment and Closure Action
- Air Depot Road/Tinker Gate Realignment
- Child Development Center

Projects Planned for Construction:

- Harry Twaddle Facility Acquisition
- Demolition of Building 3108
- KC-46A Maintenance Beddown
- Air Traffic Controller Tower Construction
- Physical Fitness Center Construction
- Consolidated Security Forces, South Forty Development Construction
- Military Family Housing Privatization
- Vance Gate Relocation
- Airborne Warning and Control System Maintenance Group Complex at Building 230 Repair and Renovation
- Maintenance, Repair, and Overhaul Technology Center Acquisition
- Large Engine Test Cell Construction
- Chemical Cleaning Line in Building 3001 Renovation
- T9 Test Cell at Tinker Aerospace Complex (TACX) Construction
- Midwest Boulevard Gate Construction
- Fee/Title Acquisition for TACX
- Retrofit Boilers and Install Landfill Gas Generation Serving TACX Facility
- Steam Decentralization Project
- Repair by Replacement JP-8 Fuel Transfer Line
- Construct Vehicle Fueling Station (southwest of airfield)

Future construction projects listed above and their associated cumulative impacts are further evaluated for each environmental resource area in Chapter 3 of this EA.

2.6 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts are evaluated in Chapter 4, Environmental Consequences. Table 2-2 summarizes the potential impacts for resource areas fully evaluated and associated with the Proposed Action and the No Action Alternative.

Table 2-2. Summary of Environmental Impacts for Proposed Replacement of Type III Hydrant Fueling System at Tinker AFB, Oklahoma

Air Quality and Greenhouse Gas Emissions
Proposed Action ▪ Emissions from demolition and construction activities would be negligible and impacts would be short-term. Construction emissions would not cause or contribute to a violation of any national, state, or local ambient air quality standard, nor would they expose sensitive receptors to substantially increased pollutant concentrations. ▪ Operational air pollutant emissions from the implementation of the Proposed Action would be less than the current air pollutant emissions from the existing hydrant fueling system (e.g., elimination of fuel vapors released from refueler trucks). ▪ The Proposed Action would result in long-term beneficial operational impacts on air quality through a net reduction of air pollutant emissions. ▪ The Oklahoma City Area is classified as attainment for all criteria pollutants. An EPA General Conformity Analysis is not required. ▪ Greenhouse gas emissions from construction would amount to approximately 0.000003 percent of the total greenhouse gas emissions generated by the U.S.; there would be no measurable impacts to global climate change.
No Action Alternative ▪ There would be no changes to existing air pollutant emissions from aircraft fueling and defueling operations at Tinker AFB. Existing air pollutant emissions are less than 10 percent of the Oklahoma County area emissions and are not considered significant.
Cultural Resources
Proposed Action ▪ There are no known archaeological sites within or immediately adjacent to the project area. ▪ There are no National Register of Historic Places (NRHP)-listed resources within the Area of Potential Effect (APE) for the Proposed Action. ▪ The Air Force has consulted with Native American tribes and groups in the area . No concerns have been raised to date. ▪ Impacts to Native American interests in the area would not be expected.
No Action Alternative ▪ There would be no changes to existing cultural resources at Tinker AFB. Impacts to Native American interests in the area would not be expected.
Geologic Resources and Soils
Proposed Action ▪ Construction would occur within an area where the physiographic features and geologic resources have been previously disturbed. ▪ Demolition and construction would not require any permanent removal of topsoil or the need for extensive fill. No permanent alteration of surface features would occur.
No Action Alternative ▪ There would be no changes to existing surface features.

Table 2-2. Summary of Environmental Impacts for Proposed Replacement of Type III Hydrant Fueling System at Tinker AFB, Oklahoma (Cont'd)

Hazardous Materials and Hazardous Waste
Proposed Action ▪ Regulated waste such as asbestos containing materials, lead-based paint, polychlorinated biphenyls (PCB) and mercury would be contained and disposed in accordance with all applicable standards by a licensed contractor. ▪ Compliance with applicable requirements would result in negligible impacts from exposure to hazardous substances during demolition of existing facilities and construction of the new facilities. ▪ Because soil and groundwater contamination from past fuel releases is present in the project area, any contaminated soil from trenching or excavation would be tested prior to disposal. ▪ Operations of the replacement Type III hydrant fueling system would not result in the generation or disposal of hazardous materials or wastes. ▪ The likelihood of spills from the transfer of fuel using refueler trucks would be eliminated when the new hydrant fueling system is operational. ▪ Ongoing remediation and investigation at nearby contaminated sites would not be impeded during the use and operation of the new hydrant fueling system. **There would be no adverse impacts on or from hazardous materials or wastes or contaminated sites during operation of the Proposed Action.**
No Action Alternative ▪ Regulated waste such as asbestos containing materials, lead-based paint, PCBs and mercury would remain on existing structures and not be removed. ▪ The potential for spills from the transfer of fuel using refueler trucks would continue.
Water Resources
Proposed Action ▪ The Proposed Action would be constructed to avoid disturbance to Kuhlman Creek. Best Management Practices for erosion control would be followed in accordance with construction permit conditions and the Storm Water Pollution Prevention Plan (SWPPP). ▪ No change to the amount of infiltration areas or changes to groundwater recharge would occur. ▪ There are no wetlands in the area of the Proposed Action that would be affected by construction or operations. ▪ The Proposed Action should not result in any change in the elevation, function, or capacity of the existing floodplain associated with Kuhlman Creek. The Proposed Action would have temporary negligible impacts on the Kuhlman Creek floodplain in the 480 Tanks Area; no permanent impacts would occur.
No Action Alternative ▪ There would be no changes to Kuhlman Creek, groundwater resources, wetlands or the floodplain associated with Kuhlman Creek.

2.7 MITIGATION MEASURES

No mitigation measures would be required.

2.8 BEST MANAGEMENT PRACTICES

Although no mitigation measures would be required, Best Management Practices (BMP) will be identified in required plans, permits and approvals to be obtained for the project as discussed in Subchapter 1.4.5. Environmental protection and compliance requirements before and during construction will also be included with contract specifications Section 00 72 00 (*Environmental*

Requirements for Construction Contracts), as described in Subchapter 2.3. Table 2-3 provides a summary of the best management practices that would be implemented as part of the Proposed Action.

Table 2-3. Summary of Best Management Practices for Proposed Replacement of Type III Hydrant Fueling System at Tinker AFB, Oklahoma

Air Quality and Greenhouse Gas Emissions
▪ During construction, all disturbed areas which are not being actively used for construction, shall be stabilized for dust emissions using water, chemical stabilizer or suppressants, covered with a tarp or other suitable cover. ▪ During construction, the construction contractor will ensure that heavy duty off-road and on-road construction equipment are properly tuned to minimize emissions during operation.
Cultural Resources
▪ To avoid impacts to archaeological resources, the Air Force would ensure that any archaeological deposits discovered during construction activities would be managed in accordance with the compliance procedures described in Section E.13 of the Tinker AFB ICRMP (*Unexpected Discoveries of Archaeological Materials During Construction Projects*) and the provisions of applicable law(s) such as NHPA Section 106 (36 CFR 800.13). The procedural requirement for protection of cultural resources following an unanticipated discovery will be included in project planning requirements. ▪ Native American tribes would be consulted for any post-review discoveries of historic properties, certain or potential materials subject to the Native American Graves Protection and Repatriation Act (NAGPRA), and other Native American cultural resources of interest. Consultation with Native American tribes, if necessary, would be conducted in accordance with procedures outlined in the ICRMP.
Geologic Resources and Soils
▪ The hydrant system would be designed and constructed in accordance with engineering standards applicable to soil characteristics at the project site. ▪ BMPs for erosion control would be followed in accordance with construction permit conditions and the SWPPP. ▪ Install silt fences, compost berms, filter socks or other similar measures, as appropriate, for managing soil erosion.
Hazardous Materials and Wastes
▪ Regulated waste such as asbestos containing materials, LBP, PCB and mercury would be contained and disposed in accordance with all applicable standards by a licensed contractor.
Water Resources
▪ Obtain Storm Water General Permit for Construction Activities – Permit No. OKR10 issued by Oklahoma DEQ. ▪ Minimize the total amount of ground disturbance and preserve vegetative cover to the amount practicable. ▪ Install silt fences, compost berms, or filter socks or other similar measures for managing storm water runoff. ▪ Limit construction staging areas to previously disturbed areas. ▪ Service and refuel equipment away from streams, and ensure all chemicals and petroleum products are stored and contained away from water sources.

2.9 IDENTIFICATION OF THE AGENCY PREFERRED ALTERNATIVE

Based on the analyses conducted for this EA, the Air Force has identified the Proposed Action, as described in Subchapter 2.3, as the Agency Preferred Alternative.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental resources that could be affected by or could affect the No Action Alternative and Proposed Action. Only those specific resources relevant to potential impacts are described in detail. The baseline represents the current condition for the respective resource or conditions that may exist due to the No Action Alternative. This chapter also evaluates the potential environmental consequences resulting from implementation of the Proposed Action and the No Action Alternative. Cumulative impacts are also discussed for each resource area. Where appropriate, the need for mitigation measures or best management practices is indicated.

3.1 AIR QUALITY

3.1.1 Definition of Resource

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere, typically expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Air quality is affected by emissions from stationary sources (e.g., industrial development), fugitive sources (e.g., windblown dust), and mobile sources (e.g., motor vehicles). Air quality is a function of several factors, including the quantity and type of pollutants emitted locally and regionally, and the dispersion rates of pollutants in the region. Factors affecting pollutant dispersion include wind speed, wind direction, atmospheric stability, temperature, the presence or absence of inversions, and topography.

3.1.1.1 Criteria Pollutants

National Ambient Air Quality Standards (NAAQS) are established by the United States Environmental Protection Agency (EPA) under the Clean Air Act (CAA) for criteria pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), and lead. The primary NAAQS set limits to protect public health, including sensitive populations such as children, the elderly, and individuals suffering from respiratory disease, with an adequate margin of safety. The secondary NAAQS set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings. The NAAQS and the corresponding state of Oklahoma Standards are presented in Table 3-1.

Ozone. Most ground-level (i.e., terrestrial) ozone is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds, and nitrogen oxides (NO_x) in the presence of sunlight. Ozone is a highly reactive gas that damages lung tissue, reduces lung function, and sensitizes the lung to other irritants. Although stratospheric ozone shields the earth from damaging ultraviolet radiation, ground-level ozone is a highly damaging air pollutant and is the primary source of smog. In March 2008, the EPA published a new standard for 8-hour ozone, and revoked the 1-hour NAAQS for ozone in most areas. The 8-hour standard is more protective of public health and more stringent than the 1-hour standard, and nonattainment areas for the 8-hour ozone standard have now been established.

Table 3-1. National and State of Oklahoma Ambient Air Quality Standards

Criteria Pollutant	Averaging Period	Primary NAAQS[b,c]	Secondary NAAQS[c]	Oklahoma State Primary Standards[a]
Carbon Monoxide	8-hour 1-hour	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	No Standard No standard	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)
Lead	Quarterly Rolling 3-Month Average	1.5 µg/m^3 0.15 µg/m^3	1.5 µg/m^3 0.15 µg/m^3	No Standard 0.15 ug/m^3
Nitrogen Oxides (measured as NO_2)	Annual 1-Hour	0.053 ppm (100 µg/m^3) 0.100 ppm	0.053 ppm (100 µg/m^3) No Standard	0.053 ppm (100 ug/m^3) 0.100 ppm (190 µg/m^3)
Ozone[e]	8-hour 1-hour	0.075 ppm (157 µg/m^3)[f] No Standard	0.075 ppm (157 µg/m^3) No Standard	0.075 ppm (157 µg/m^3) No Standard
Particulate Matter (measured as PM_{10})	Annual 24-hour	No Standard 150 µg/m^3	No Standard 150 µg/m^3	No Standard 150 µg/m^3
Particulate Matter (measured as $PM_{2.5}$)	Annual 24-hour	15 µg/m^3 35 µg/m^3	15 µg/m^3 35 µg/m^3	15 µg/m^3 35 µg/m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour 1-Hour[d]	0.03 ppm (80 µg/m^3) 0.14 ppm (365 µg/m^3) No Standard No Standard	No standard No standard 0.5 ppm (1,300 µg/m^3)	No Standard No Standard No Standard 75 ppb

a Source: Oklahoma Administrative Code, Title 252 – Department of Environmental Quality, Chapter 100- Air Pollution Control

b National and state standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration is above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d The standard is attained when the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area does not exceed 75 ppb, as determined in accordance with 40 CFR 50, Appendix T.

On January 19, 2010, EPA proposed new rules revising the March 2008 primary and secondary standards for ground-level ozone to more stringent levels. The comment period for the proposed revisions ended on March 22, 2010 and, to this date, the revisions have not been finalized.

Carbon Monoxide. CO is a colorless, odorless, poisonous gas produced by incomplete burning of carbon in fuel. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

Nitrogen Dioxide. NO_2 is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO_2 may cause acute respiratory disease in children. Because NO_2 is an important precursor in the formation of ozone (or smog), control of NO_2 emissions is an

important component of overall pollution reduction strategies. The two primary sources of NO_2 in the United States are fuel combustion and transportation emissions. On January 22, 2010, EPA strengthened the NAAQS for NO_2 by setting a new 1-hour standard.

Sulfur Dioxide. SO_2 is emitted primarily from stationary-source coal and oil combustion, steel mills, refineries, pulp and paper mills, and nonferrous smelters. High concentrations of SO_2 may aggravate existing respiratory and cardiovascular disease; asthmatics and those with emphysema or bronchitis are the most sensitive to SO_2 exposure. SO_2 also contributes to acid rain, which can lead to the acidification of lakes and streams and damage trees. On June 2, 2010, EPA strengthened the primary NAAQS for SO_2 by establishing a new 1-hour standard in order to protect the public from high, short-term exposures to SO_2. Additionally, the EPA revoked the existing annual and 24-hour standards due to insufficient evidence linking long-term exposure to SO_2 and health effects. The secondary SO_2 NAAQS 3-hour standard of 0.5 parts per million will remain in effect, but the EPA is assessing the need for a change in the standard under a separate review.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter is a mixture of tiny particles that vary greatly in shape, size, and chemical composition and can be composed of metals, soot, soil, and dust. PM_{10} includes large, coarse particles, whereas $PM_{2.5}$ includes small, fine particles. Sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads. Sources of fine particles include all types of combustion activities (e.g., motor vehicles, power plants, wood burning) and certain industrial processes. Exposure to PM_{10} and $PM_{2.5}$ levels exceeding current standards can result in increased lung- and heart-related respiratory illnesses. The EPA has concluded that finer particles (less than 2.5 microns in diameter) are more likely to contribute to long-term health problems than those particles greater than 10 microns in diameter, which typically result in short-term health problems.

Airborne Lead. Airborne lead can be inhaled directly or ingested indirectly through the consumption of lead-contaminated food, water, or nonfood materials such as dust or soil. Fetuses, infants, and children are most sensitive to lead exposure, which has been identified as a factor in high blood pressure and heart disease. Exposure to lead has declined dramatically in the last several decades as a result of the reduction of lead in gasoline and paint, and the elimination of lead from soldered cans.

3.1.1.2 Clean Air Act Amendments

The Clean Air Act Amendments (CAAA) of 1990 placed most of the responsibility to achieve compliance with the NAAQS on individual states. Areas not in compliance with any of the NAAQS can be declared *nonattainment* areas. Nonattainment areas are designated for each pollutant addressed by the NAAQS. Once the EPA declares an area as *nonattainment*, the EPA requires each state to prepare a State Implementation Plan (SIP) for the state to achieve compliance with the NAAQS. The EPA will develop a Federal Implementation Plan for a state if it fails to develop an adequate SIP. To be redesignated to *attainment,* the area must show through monitoring and modeling that the pollutant levels are consistently meeting the NAAQS and have been maintained for 10 consecutive years. During this time, the declared area is in transitional attainment, also known as a *maintenance area.*

Under 40 CFR 93, the EPA issued conformity regulations that mandate the federal government to not engage, support, or provide financial assistance for licensing, permitting, or approval of any activity that does not conform to an approved SIP or Federal Implementation Plan. This rule

applies to all federal actions except for those projects requiring funding or approval from the U.S. Department of Transportation, the Federal Highway Administration, the Federal Transit Administration, or the Metropolitan Planning Organization; such projects must instead comply with the conformity rules established by the U.S. Department of Transportation. The General Conformity rule applies to any federal action that results in direct or indirect emissions for criteria pollutants that exceed the rates specified in 40 CFR 93.153(b)(1) for sources in *nonattainment* or *maintenance areas*. The intent of the conformity rule is to encourage long range planning by evaluating the air quality impacts from federal actions before the projects are undertaken.

3.1.1.3 Hazardous Air Pollutants

The EPA regulates hazardous air pollutants (HAP) through the National Emission Standards for Hazardous Air Pollutants (NESHAP) program and rules. The EPA designated approximately 187 compounds as HAPs based on their toxicity and use throughout various industries. The EPA has not established ambient air quality standards for the compounds, but regulates HAPs through industrial sources.

3.1.1.4 Greenhouse Gases

Greenhouse gases (GHG) are measured by the global warming potential a given type of GHG may cause. CO_2 is used as the reference for measuring global warming potential. Equivalent carbon dioxide (CO_2e) is a unit of measurement for describing GHG concentration. The principal GHGs that enter the atmosphere because of human activities are described below.

Carbon Dioxide. CO_2 is a GHG that enters the atmosphere through the burning of fossil fuels (e.g., oil, natural gas, coal), solid waste decay, and trees and wood products and also as a result of chemical reactions (e.g., manufacture of cement). The two primary sources of CO_2 in the United States are combustion of fossil fuels, including transportation emissions, and industrial production processes. CO_2 can be removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of photosynthesis and the biological carbon cycle. However, in areas where CO_2 concentration ratios exceed the intake capabilities by plants, this gas contributes to negative GHG effects.

Methane. CH_4 is a GHG that is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous Oxide. N_2O is a GHG that is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Fluorinated Gases. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFC) are synthetic GHGs with high CO_2e factors that are emitted from a variety of industrial processes. HFCs, PFCs, and SF_6 are sometimes used as substitutes for ozone-depleting fluorinated gases (i.e., CFCs, HCFCs, and halons). HFCs, PFCs, and SF_6 are typically emitted in smaller quantities and, while these substances do not deplete ozone, they are potent GHGs and are referred to as *high global warming potential* gases.

3.1.2 Air Quality Regulations

Air quality regulatory standards are periodically reviewed by the EPA. Both the Oklahoma Department of Environmental Quality (DEQ) Air Quality Division and the EPA are planning for review of major environmental laws that will likely result in more stringent standards for the criteria pollutants and the determination of prevention of significant deterioration (PSD) rules which apply to sources in attainment areas. The changes that are expected to have the greatest impact on the Proposed Action are changes to the NAAQS.

The EPA is reexamining NAAQS for particulate matter, SO_2, ozone, and NO_2 and to determine the PSD implications of declaring CO_2 as an air quality pollutant. The anticipated revision of the NAAQS for ground-level ozone to an estimated range of 60 to 70 parts per billion would place Oklahoma County in nonattainment status for ozone.

The final rule on GHG emissions from stationary sources established a schedule of CAA permitting programs to define which facilities will be required to obtain PSD and Title V permits. The first scheduled phase began on January 2, 2011, establishing a GHG permitting program for large GHG emitters subject to PSD permitting. Any newly constructed facility or existing facility modified in a way that substantially increases emissions of pollutants other than GHGs will be subject to permitting requirements for GHG emissions under PSD. Only GHG emissions above 75,000 tons per year (tpy), on a CO_2e basis, will be required to undergo a best available control technology (BACT) analysis. Similarly under the operating permit program, only sources subject to the program (i.e., newly constructed or existing major sources for pollutants other than GHGs) will be subject to Title V requirements for GHG.

Phase 2 of this rule began in July 2011 and will continue through June 2013. This phase affects sources subject to PSD permitting requirements for new construction projects that emit GHG emissions of at least 100,000 tpy even if they do not exceed PSD permitting thresholds for any other pollutant. Modifications to existing facilities that increase GHG emissions by at least 75,000 tpy will be subject to permitting requirements even if they do not significantly increase emissions of any other pollutant. Additionally, operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they do not apply based on emissions of other pollutants. Facilities emitting at least 100,000 tpy CO_2e will be subject to Title V permitting requirements.

Executive Order 13514 also introduced new GHG emission management requirements for the federal government. This E.O. requires agencies to establish reduction targets for GHG emissions as well as to develop an inventory of GHG emissions. The primary GHGs that enter the atmosphere because of human activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases.

Air quality management at Air Force installations is established in AFI 32-7040, *Air Quality Compliance*. AFI 32-7040 requires installations to achieve and maintain compliance with all applicable federal, state, and local standards.

3.1.2.1 Internal Combustion Engines

The Proposed Action includes the replacement of the existing 500 kW emergency generator with a new 500 kW generator. The EPA has developed standards to regulate exhaust gases from stationary reciprocating internal combustion engines (ICE) such as those used in generators. Standards applicable to stationary reciprocating ICEs include 40 CFR Part 63, Subpart ZZZZ,

National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, and 40 CFR Part 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. These standards establish emission limits and work practice standards for reciprocating ICEs. Additionally, recordkeeping and source testing may be required during the permitting process to show compliance with these standards.

3.1.2.2 Storage Vessels for Petroleum Liquids

The Proposed Action includes the refurbishment of two 10,000 barrel JP-8 aboveground storage tanks (AST). The applicable NSPS is 40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*. Vessels with a design capacity greater than or equal to 39,980 gallons containing a volatile organic liquid that, as stored, has a maximum true vapor pressure less than 3.5 kiloPascals (kPa) [or 0.51 pounds per square inch (psi)] are exempted from all requirements except record keeping. The NSPS requires that records be kept readily accessible showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessels.

3.1.3 Existing Conditions

3.1.3.1 Climate

Daily temperatures and daily minimum temperatures average 38.6 degrees Fahrenheit (°F) and 27.8°F, respectively, in the winter. In the summer, daily temperatures and daily maximum temperatures average 80°F and 91.1°F, respectively. The average annual precipitation is 33.35 inches. The majority of precipitation, 74 percent, usually falls from April through October; the average seasonal snowfall is 9.1 inches. Prevailing winds blow from the south with the average speed of 14 miles per hour in March and April.

3.1.3.2 Local Air Quality

Oklahoma County is currently designated as an *attainment* area for CO, SO_2, NO_2, and particulate matter (PM_{10} and $PM_{2.5}$). A five-year Ozone Early Action Compact for Oklahoma City was completed in December 2007. In June 2008, the Association of Central Oklahoma Governments (ACOG) developed an 8-hour ozone flex plan for Oklahoma City for the successive five years, similar to the Ozone Early Action Compact. This voluntary plan identified strategies that would reduce transportation-related emissions by improving traffic flow and reducing congestion throughout the region. Typical control strategies included intersection improvements, traffic signal modifications, signal coordination efforts, intelligent transportation techniques, and travel reduction programs.

Eleven air quality monitoring stations are located within Oklahoma County, including one CO monitoring station, one PM_{10} monitoring station, three $PM_{2.5}$ monitoring stations, one SO_2 monitoring station, three ozone monitoring stations, and two NO_2 monitoring stations. According to EPA AirData, ambient-level concentrations for PM_{10}, $PM_{2.5}$, NO_2, and CO within Oklahoma County have not exceeded the primary NAAQS from 1998 through 2008; however, concentrations of ozone have exceeded the 8-hour NAAQS within that period. Table 3-2 presents the most recent (2002) air pollutant emissions inventory for Oklahoma County.

Table 3-2. Air Pollutant Emissions Inventory for Oklahoma County

Pollutant	Emissions (tons)
PM_{10}	26,033
$PM_{2.5}$	3,711
VOC	37,797
NOx	34,099
SO_2	1,944
CO	277,079

Source: USEPA, 2011b

3.1.3.3 Tinker AFB

The Oklahoma DEQ has jurisdiction over and regulates air emissions associated with Tinker AFB. Under the CAA, the Title V Operating Permit Program imposes requirements for air quality permitting on air emission sources and the NESHAP program specifies various provisions for regulated sources, including limits on HAP emissions, compliance demonstrations and performance testing, monitoring, recordkeeping, and reporting. Tinker AFB is categorized as a major source under the Title V program and is also regulated under NESHAP since its potential emissions from stationary sources exceed 100 tpy of any of the criteria pollutants, 10 tpy of any single HAP, or 25 tpy of any combination of HAPs. Tinker AFB maintains a Title V Air Permit. The following are the primary onsite emission sources at Tinker AFB:

- Stationary combustion sources (e.g., boilers, water heaters, furnaces, gasoline and diesel-fuel generators, engine test cells).
- Operational sources (e.g., chemical usage, paints, degreasers, abrasive blasting, welding operations, fuel cell maintenance, wastewater treatment, small arms firing range).
- Fuel-storage/transfer operations (e.g., horizontal tanks, internal floating roof tanks).
- Mobile sources (e.g., vehicle operations, aircraft operations, trim and power checks, aerospace ground equipment). Mobile sources are not regulated under the Title V program but fall under the Non-Road Mobile Source program, fuel efficiency and corporate average fuel economy standards.

Table 3-3 presents estimated air pollutant emissions for sources affected by the Proposed Action. Emissions include VOC fugitive emissions from the storage (two ASTs) and transfer of jet fuel using refueler trucks and the existing hydrant fueling system (including associated auxiliary equipment such as pumps, filters, discharge valves and fuel hydrant outlets), and combustion emissions from the existing 500-kW emergency generator. In comparison to the local emissions air pollutant inventory shown in Table 3-2, existing emissions represent a negligible percentage of overall emissions in Oklahoma County. These emission estimates provide the emissions baseline upon which to determine potential impacts to air quality from the Proposed Action.

3.1.4 Approach to Analysis

Impacts to air quality in attainment areas would be considered significant if: (1) pollutant emissions associated with the implementation of the federal action caused or contributed to a violation of any national, state, or local ambient air quality standard; (2) exposed sensitive receptors to substantially increased pollutant concentrations; (3) represented an increase of ten percent or more in the emissions inventory for an affected Air Quality Control Region (AQCR); or, (4) exceeded any significance criteria established in a SIP.

Table 3-3. Estimated Air Pollutant Emissions from Existing Type III Hydrant Fueling System Operation

Pollutant	Emissions (tons per year)
PM_{10}	0.04
$PM_{2.5}$	0.04
VOC	11.89
NOx	0.50
SO_2	0.03
CO	0.11
HAPs*	0.00
CO_2	18.49

* Estimates for benzene and toluene only during fuel combustion for generator.

The state of Oklahoma does not have any nonattainment areas for NAAQS pollutants and does not currently have a SIP in place for the Oklahoma City area. Therefore, USEPA General Conformity rules do not apply.

The air quality analysis presented below evaluates impacts based on current regulations. If regulations change prior to implementation of the Proposed Action, air quality impacts should be reevaluated against any new standards.

3.1.5 Proposed Action

Pollutant emissions associated with implementation of the Proposed Action at Tinker AFB would include the following:

- Construction emissions (i.e., fugitive dust emissions) generated during demolition, pavement removal/replacement, and site preparation
- Combustion emissions from construction-related vehicles and heavy equipment
- Operational emissions associated with the use of the new hydrant fueling system and the new emergency generator

Construction-related emissions would be temporary and would not last beyond completion of the Proposed Action. It is anticipated that emissions resulting from construction activities would have little to no impact on ambient air quality.

Construction Emissions

Dust Emissions

Under implementation of the Proposed Action, construction dust emissions (i.e., PM_{10}, a criteria pollutant) would be generated during construction activities. Construction activities would occur over a period of 12 months. Demolition and construction activities to install the new hydrant fueling system and its auxiliary equipment would entail the use of various heavy-duty, off-road, construction equipment (e.g., bulldozers, trenchers, forklifts, concrete saws) and heavy duty trucks for hauling construction materials and equipment. Construction equipment and vehicles would be kept on site at a temporary staging area within the project area that would not be disturbed.

Construction dust emissions can vary substantially daily depending on levels of activity, specific operations, and prevailing meteorological conditions. The emission factor for demolition and

construction under a worst case scenario is estimated at 0.42 tons/acre/month (Western Regional Air Partnership, 2011). Based on one week of site demolition and one week of site preparation for the pump house construction, and six months of pavement sawing and trenching for the loop pipeline/hydrant outlet site preparation, estimated PM_{10} emissions would total approximately 2.8 tons from the 7.1-acre construction area. The construction area includes the pump house area and the area of pavement to be removed and replaced for the loop pipeline and the hydrant outlets.

PM_{10} emissions from site preparation would be negligible and impacts would be short-term. Standard dust minimization practices, such as watering construction areas would further reduce PM_{10} emissions, lessening impacts on local air quality. Construction emissions would not cause or contribute to a violation of any national, state, or local ambient air quality standard, nor would they expose sensitive receptors to substantially increased pollutant concentrations. Therefore, construction of the Proposed Action would result in short-term negligible impacts on local air quality.

Combustion Emissions

Combustion emissions associated with construction-related vehicles and equipment would be minimal because most vehicles would be driven to and kept at the affected site for the duration of construction activities. Emission factors for off-road construction equipment and heavy-duty, on-road trucks for the year 2014 (anticipated year of construction) were retrieved from the South Coast Air Quality Management District website (SCAQMD, 2011) for the types of equipment likely to be used for this project and applied. Results of emission calculations for combustion emissions from construction equipment are presented in Table 3-4.

Table 3-4. Estimated Combustion Emissions from Construction Equipment

Pollutant	Emissions (tons)
PM_{10}	0.10
$PM_{2.5}$	0.10
VOC	0.26
NO_x	1.79
SO_2	<0.01
CO	0.99
CO_2	238.61

As is the case with PM_{10} emissions associated with site preparation activities, emissions generated by construction equipment would be temporary. Therefore, combustion emissions would be temporary with negligible impacts on air quality under the Proposed Action.

The Proposed Action would result in generation of air pollutant emissions during the construction period. This would be a temporary condition that would not contribute to a violation of any national, state, or local ambient air quality standard, or expose sensitive receptors to substantially increased pollutant concentrations.

GHG emissions associated with construction-related vehicles and equipment are estimated at 239 tons over the duration of construction activities. The temporary GHG emissions from construction activities associated with the Proposed Action would not contribute to a violation of any national, state, or local ambient air quality standard or expose sensitive receptors to

substantially increased pollutant concentrations. Therefore, GHG emissions that result from construction-related activities would be temporary and would result in negligible impacts.

Operational Emissions

Implementation of the Proposed Action would result in a decrease in NAAQS criteria pollutants. Long-term operational emissions associated with the Proposed Action would result from the following:

- VOC fugitive emissions from the fuel storage tanks and the hydrant fueling system
- Firing of the 500-kW emergency generator for four hours a month to ensure its availability when needed

Fugitive emissions of VOC are emitted during fueling and defueling of aircraft. Under the existing system, fuel vapors from aircraft are released to the atmosphere when fueled using the hydrant or a refueler truck. Fuel vapors are also released to the atmosphere from the refueler truck when the refueler truck defuels an aircraft. Under the new system of 100 percent hydrant operations (i.e., fueling and defueling using the new hydrant fueling system), there would no longer be any fuel vapors released from refueler trucks from aircraft defueling. As a result, VOC emissions from the Proposed Action would decrease. VOC emissions would include breathing losses from the fuel storage tanks, fugitive emissions from the hydrant fueling system components, and fugitive emissions from aircraft fueling.

The new 500-kW emergency generator would replace a 500-kW emergency generator. The replacement generator would be operated in the same manner as the existing emergency generator at four hours a month to ensure availability of power to the system in the event of a power emergency. Emissions from the new generator would be about the same as those from the existing generator.

Table 3-5 presents operational emissions from the No Action Alternative, the Proposed Action and estimated emission reductions as a result of the Proposed Action.

Table 3-5. Operational Emissions from Proposed Action and Estimated Emission Reductions

Pollutant	Estimated Emissions (tpy)		Emissions (tons)
	No Action Alternative	Proposed Action	
PM_{10}	0.04	0.04	-
$PM_{2.5}$	0.04	0.04	-
VOC	11.89	11.59	(0.30)
NO_x	0.50	0.50	-
SO_2	0.03	0.03	-
CO	0.11	0.11	-
HAPs*	<0.01	<0.01	negligible
CO_2	18.49	18.49	-

* Estimates for benzene and toluene only during fuel combustion for generator

The estimated VOC emissions from the implementation of the Proposed Action would be less than the current VOC emissions from the existing hydrant fueling system. Therefore, implementation of the Proposed Action would result in long-term beneficial operational impacts on air quality through a net reduction of VOC emissions.

It is expected that the Proposed Action could be accommodated under the existing Title V Permit No. 2009-394-TVR; however, the Air Force would need to notify the Oklahoma DEQ and confirm that the proposed construction would not require further permit action.

3.1.6 Greenhouse Gases

On February 18, 2010, the CEQ released its Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, which suggests that Proposed Actions that would be reasonably anticipated to emit 25,000 metric tons or more of carbon dioxide equivalents (CO_2e) of GHG emissions annually should be evaluated by quantitative and qualitative assessments. This is not a threshold of significance but a minimum level that would require consideration in NEPA documentation. The purpose of quantitative analysis of CO_2e GHG emissions in this EA is for its potential usefulness in making reasoned choices among alternatives.

GHGs have varying global warming potentials (GWP). The GWP is the potential of a gas to trap heat in the atmosphere. The reference gas for GWP is CO_2, which has a GWP of one. Methane has a GWP of 21, which means that it has a 21-times greater global warming effect than CO_2 on a mass basis. N_2O has a GWP of 310.

Greenhouse gases are calculated in emissions of three pollutants: CO_2; CH_4; and N_2O. Because other greenhouse gases represent a small fraction of emissions, a carbon dioxide equivalent of the combined emissions of all greenhouse gases is computed to indicate the anticipated amount of greenhouse gases from an activity. The combined emissions of various GHG from a project are presented as a CO_2 equivalent (CO_2e). The total CO_2e is calculated by multiplying the amount of each GHG emitted from the project by its GWP, and adding each gas value to derive a total.

The Proposed Action would generate approximately 239 tons of CO_2 and minimal amounts of CH_4 and N_2O over the 12-month construction period. Combustion emissions of CO_2, CH_4 and N_2O from construction of the Proposed Action were converted into CO_2e and compared to the U.S. 2009 GHG emissions as shown in Table 3-6.

Table 3-6. Greenhouse Gas Emissions from Construction of the Proposed Action

	Greenhouse Gas, metric tons per year			
	CO_2	CH_4	N_2O	CO_2e
Proposed Action	238.61	0.014	0.006	240.79
U.S. 2009 GHG Baseline Emissions[1]				6,633,200,000
Percent of U.S. 2009 GHG Baseline Emissions				0.00000363

[1] Source: USEPA, 2011a

Greenhouse gas emissions from construction of the Proposed Action would amount to approximately 0.000004 percent of the total GHG emissions generated in the United States in 2009. When this individual project's contribution to greenhouse gas emissions is compared to that produced by activities elsewhere in the world, the mass of greenhouse gas emissions generated by construction of the Proposed Action would be so small that the concentration of greenhouse gas emissions in the atmosphere would not be expected to change. These greenhouse gas emissions would occur at the same time as other reasonably foreseeable projects on Tinker AFB or in the area. The proposed construction of the replacement Type III hydrant fueling system would not generate enough greenhouse gas emissions to influence global climate

change on its own. If viewed apart from greenhouse gas emissions produced by activities elsewhere in the world, the greenhouse gas emissions from construction of the Proposed Action would be so minute that the concentration of global greenhouse gas emissions in the atmosphere would essentially remain the same. The impact of the project's contribution to greenhouse gases during construction, therefore, is not considered cumulatively considerable.

With regard to the operational phase, the source of greenhouse gases from the Proposed Action is the four-hour monthly operation of the replacement generator. Because the generator is a replacement in kind (the same size), greenhouse gases from the generator are already included in the baseline and no additional greenhouse gases would be emitted. Therefore, there are no cumulative impacts to greenhouse gas emissions from operation of this project.

3.1.7 Cumulative Impacts

Construction-related air pollutant emissions associated with the Proposed Action would be temporally and spatially limited. It is not expected that these emissions, when added to emissions from one or more of the reasonably foreseeable concurrent actions identified in Subchapter 2.5, would exceed ambient air quality standards or expose sensitive receptors to substantially increased pollutant concentrations. Therefore, the Proposed Action would not have a cumulative impact on air quality.

Operational emissions generated by the Proposed Action would be less than existing emissions due to the reduction in VOC emissions. For this reason, operational emissions of air pollutants would not contribute to cumulative impacts to air quality.

3.1.8 No Action Alternative

If the No Action Alternative were selected, Tinker AFB would not implement the Proposed Action. Air quality conditions would not change from current conditions. Existing air pollutant emissions from current operations would continue to represent less than 10 percent of the Oklahoma County area emissions and are not considered significant. Tinker AFB would continue to operate the existing hydrant fueling system with the use of refueler trucks to fuel and defuel aircraft. Reductions in VOC emissions that would result from the implementation of the Proposed Action (refer to Table 3-7) would not be achieved.

3.1.9 Mitigation Measures

Mitigation measures would not be necessary since there are no adverse air quality impacts.

3.1.10 Best Management Practices

Best management practices to prevent or minimize adverse air quality impacts would include the following:

- During construction, all disturbed areas which are not being actively used for construction, shall be stabilized for dust emissions using water, chemical stabilizer or suppressants, covered with a tarp or other suitable cover.
- During construction, the construction contractor will ensure that heavy duty off-road and on-road construction equipment are properly tuned to minimize emissions during operation.

3.2 CULTURAL RESOURCES

3.2.1 Definition of Resource

Cultural resources include prehistoric and historic archaeological sites, buildings, structures, districts, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations at 36 CFR 800, federal agencies must take into consideration the potential effect of an undertaking on "historic properties," which refers to cultural resources listed in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Sites not yet evaluated are considered potentially eligible for inclusion in the NRHP and as such, are afforded the same regulatory consideration as nominated or previously found eligible properties.

Numerous laws and regulations require federal agencies consider the effects of a Proposed Action on cultural resources. Cultural resources on Air Force installations are managed in accordance with Air Force Instruction (AFI) 32-7065, *Cultural Resources Management*, Executive Order (E.O.) 11593 of 1971; the National Historic Preservation Act of 1966, as amended (16 USC § 470), and its implementing regulations (36 CFR 800); the Archeological and Historic Preservation Act of 1974 (P.L. 93-291); the Archaeological Resources Protection Act of 1979 (P.L. 96-95); the American Indian Religious Freedom Act of 1978 (P.L. 95-341); and the Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601). Only those potential historic properties that may be eligible under cultural resource legislation are subject to protection or consideration by a federal agency. Eligibility is determined by application of the NRHP criteria.

NHPA regulations describe the procedures for identifying and evaluating historic properties, assessing the effects of federal actions on historic properties, and consulting to avoid, reduce, or minimize adverse effects. These procedures are commonly referred to as the Section 106 process. As part of the Section 106 process, agencies are required to consult with the State Historic Preservation Officer (SHPO).

Consultation with federally recognized tribes for proposed activities that could significantly affect tribal resources or interests is required by DoD Instruction 4710.02 (14 September 2006), within which the DoD Annotated Policy on American Indians and Alaska Natives (27 October 1999) is a component, and EO 13175, *Consultation and Coordination with Indian Tribal Governments*. Resources of interest to federally-recognized tribes in this region include historic properties including archeological sites that have cultural or religious significance, sacred sites as defined under Executive Order 13007 (*Indian Sacred Sites*), traditional and materials protected under the Native American Graves Protection and Repatriation Act (NAGPRA).

Traditional cultural properties, protected under NHPA, are related to precontact (prior to European contact) and post-contact periods are associated with beliefs and cultural practices of a living culture, subculture, or community. These beliefs and practices are rooted in the group's history and are important in maintaining the cultural identity of the group.

3.2.2 Existing Conditions

The Air Force has implemented an Integrated Cultural Resources Management Plan (ICRMP) for Tinker AFB (USAF, 2011b) which fulfills its legal requirements for integrating historic preservation and cultural resource management into the overall planning and development of

projects on the installation. The ICRMP provides the historic and prehistoric framework of Tinker AFB and the surrounding area and is considered to be a complete inventory of cultural resources on Tinker AFB. The ICRMP fulfills Air Force requirements under AFI 32-7065 (*Cultural Resources Management*, 1 June 2004), and is a broad-based plan of action that identifies the base's significant cultural resources. The ICRMP provides specific guidance for managing and considering cultural resources on Tinker AFB.

3.2.2.1 Area of Potential Effect

For this analysis, the Area of Potential Effect (APE), as defined by the NHPA, includes all area on the ground that would be used for aircraft refueling (as shown on Figure 2-2). The APE encompasses the existing AWACS and MAC ramps, hydrant fueling area, control room and pump house. Identification of cultural resources potentially impacted by the Proposed Action was accomplished by reviewing information in the Tinker AFB ICRMP. Information compiled in this plan reflects resource inventories derived from past archaeological and historic building surveys of the entire land area of Tinker AFB.

3.2.2.2 Archaeological Resources

Archaeological resources are prehistoric or historic places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may include some surface deposits and below ground (subsurface) deposits. Examples of prehistoric archaeological resources include village sites, campsites, lithic scatters, burials, hearths (or hearth features), processing sites, caves and rock shelters, and petroglyph and pictograph sites. Examples of historic archaeological resources include homesteads, mines, townsites, roads and trails, privies, and trash deposits.

The entire land area of Tinker AFB has been surveyed for archeological resources. Four archaeological sites have been identified at Tinker AFB (USAF, 2011b). As shown on Table 3-7, three sites have been determined to be eligible for listing in the NRHP, and one site has been determined to be ineligible. None of these known archaeological sites are located within the APE for the Proposed Action.

Table 3-7. Archaeological Sites at Tinker AFB

Site No.	Site Description	NRHP Status
34OK-146	Historic trash scatter	Ineligible
34OK-157	Historic building complex	Eligible
34OK-166	Prehistoric open habitation without mounds	Eligible
34OK-167	Prehistoric open habitation without mounds	Eligible

Source: USAF, 2011b

3.2.2.3 Historic Buildings

Two historic property types have been identified at Tinker AFB: facilities associated with aircraft construction and modification, 1942-1946; and facilities associated with the Cuban Missile Crisis, 1962. There are no buildings or structures on Tinker AFB that are eligible for listing on the NRHP due to their association with Cold War activities (USAF, 2011b). As shown in Table 3-8, Tinker AFB has six buildings individually eligible for listing in the NRHP.

The APE for the Proposed Action includes the hydrant fueling area and the 480 fuel yard. Table 3-9 provides a summary of buildings and tanks within or adjacent to the APE.

Table 3-8. Historic Buildings at Tinker AFB

Building No.	Construction Date	Description	NRHP Eligibility
1	1942	Depot Supply	Individually Eligible
208	1942	Steam Plant	Individually Eligible
230	1942	Airplane Repair Building	Individually Eligible
240	1942	Flight Test Hangar / Base Operations	Individually Eligible
3001	1943	Douglas Assembly Building	Individually Eligible; Eligible as Contributing Property*
3105	1943	Paint Building	Eligible as Contributing Property*
3113	1943	Woodworking Building	Eligible as Contributing Property*
3202	1943	Fire Pump Station	Eligible as Contributing Property*
3203	1943	Fire Protection Water Storage Tank	Eligible as Contributing Property*
3204	1943	Switch Gear House	Eligible as Contributing Property*
3303	1943	Pump House	Eligible as Contributing Property*
4029	1951	Combat Control Center	Individually Eligible

Source: USAF, 2011b

Notes: Contributing property to the Douglas Cargo Aircraft Manufacturing Historic District. The buildings and structures in the Douglas Cargo Aircraft Manufacturing Historic District are historically significant for their role in the Douglas Cargo Aircraft Plant's World War II efforts to produce C-47 transport aircraft for the Army.

Table 3-9. Facilities Within or Near the APE for the Proposed Action

Building No.	Construction Date	Description	NRHP Eligibility
001	1942	Depot Supply	Historic Building
208	1942	Steam Plant	Historic Building
230	1942	Airplane Repair Building	Historic Building
234	1977	Security Police Entry Control Building	Not surveyed because of age
240	1942	Flight Test Hangar / Base Operations	Historic Building
260	1959	Air Freight Terminal	Surveyed; Not Eligible
265	1956	Air Freight Terminal	Surveyed; Not Eligible
267	1959	Field Training Facility	Surveyed; Not Eligible
268	1980	Air Passenger Terminal	Not surveyed because of age
289	1980	Aircraft Corrosion Control	Not surveyed because of age
480 Tanks Area			
486	1978	Pump Station	Not surveyed because of age
487	1978	Control Room	Not surveyed because of age
488	1980	Pump House	Not surveyed because of age
Tank 482	1978	Diesel UST	Not surveyed because of age
Tank 483	1978	JP-8 Fuel Tank	Not surveyed because of age
Tank 484	1978	JP-8 Fuel Tank	Not surveyed because of age

Source: Taylor, 2011

Buildings 230 and 240 are located immediately north, and outside, of the APE for the Proposed Action. These buildings have been determined eligible for the NRHP for their association with aircraft construction (1942 through 1946) and architectural style:

- Building 230 (Airplane Repair Building), constructed in 1942 in the Moderne architectural style, is composed of four large hangar bays separated by administration and support facilities. Character-defining features of Building 230 include its hangar door, arched roof, corner stair column and horizontal bands of industrial windows.
- Building 240 (Flight Test Hangar/Base Operations Building), constructed in 1942 in the International architectural style, is a large military airplane maintenance and repair hangar facility with two hangars on either side of a central bay used for administration and base operations. This building was one of the original hangars at the Oklahoma City Air Depot. Character-defining features of Building 240 include horizontal window bands, water table, and large hangar doors on each façade flanked by projected concrete surrounds with vertical detailing.

Figure 3-1 depicts the location of buildings that are NRHP-eligible in relation to the area of potential effect for the Proposed Action.

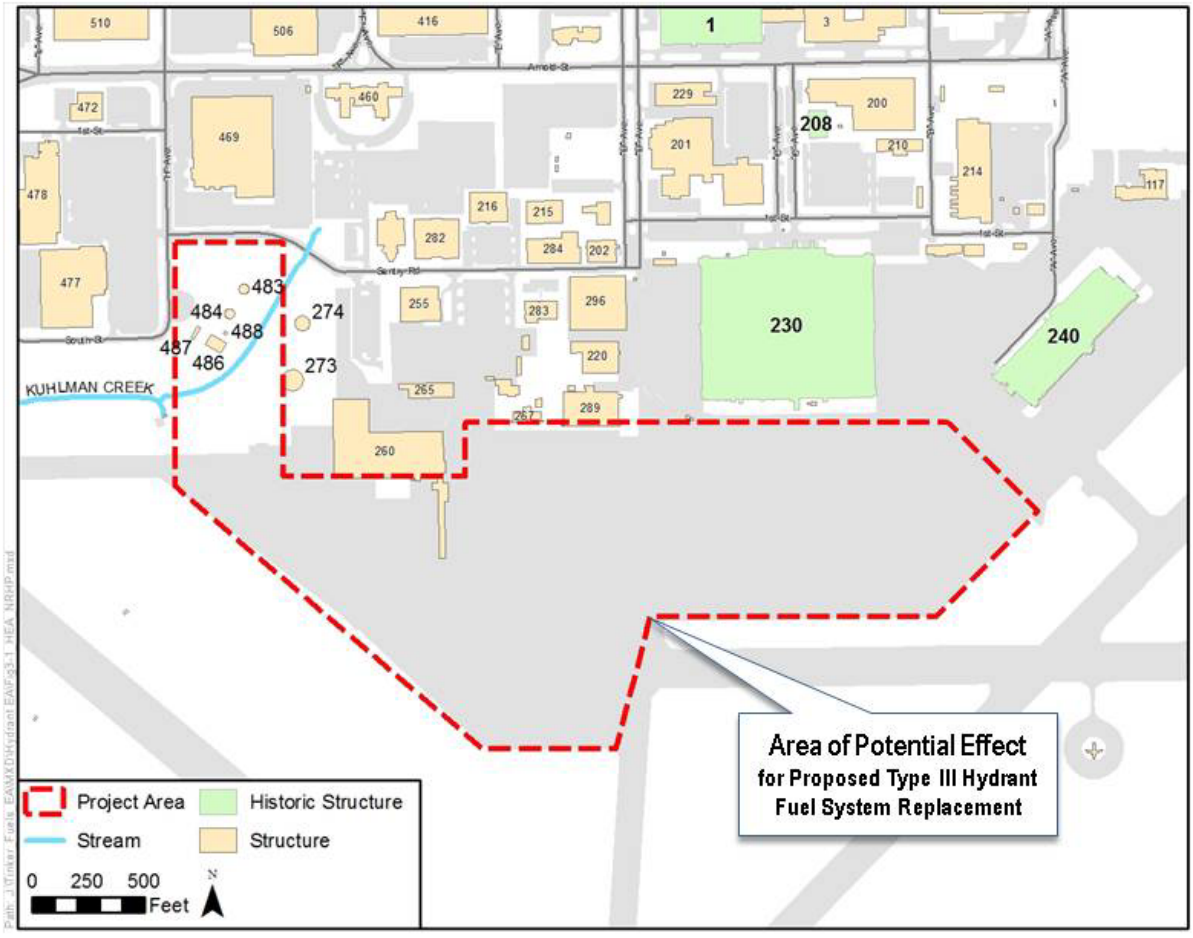

Figure 3-1. Historic Buildings Near the Proposed Action Site on Tinker AFB

3.2.2.4 Native American Interests

Native American resources can include, but are not limited to, archaeological sites, burial sites, ceremonial areas, caves, mountains, water sources, trails, plant habitat or gathering areas, or any other natural area important to a culture for religious or heritage reasons. NRHP-eligible traditional sites are subject to the same regulations, and afforded the same protection, as other

types of historic properties. The Region of Influence (ROI) for Native American traditional resources consists of those areas associated with project activities in the vicinity of Tinker AFB.

There are no sacred sites protected under Executive Order 13007 present on Tinker AFB, and no archeological sites of interest to Native American tribes. There are no traditional cultural properties, as considered under NHPA, present on Tinker AFB, including within the APE for the Proposed Action.

Five federally recognized Native American groups are located in the vicinity of the Proposed Action:

- Seminole Nation
- Muscogee (Creek) Nation
- Caddo Nation of Oklahoma
- Osage Nation
- Wichita and Affiliated Tribes

3.2.3 Approach to Analysis

An undertaking is considered to have an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. An effect is considered adverse when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties would include, but would not be limited to:

- physical destruction, damage, or alteration of all or part of the property;
- isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; and
- transfer, lease, or sale of the property (36 CFR 800.9[b]).

Any ground-disturbing action in the area of an NRHP-eligible or potentially eligible archaeological site, or modification to such a site, can affect the integrity of that cultural resource, resulting in alteration or destruction of those characteristics or qualities which make it significant and potentially eligible for inclusion in the NRHP. While archaeological sites or historic buildings or structures can be destroyed from a single construction project, more often it is the cumulative effect of recurrent disturbing actions that diminish the integrity of the cultural resource and its significant characteristics. Activities with potential to adversely affect cultural resources would be primarily be associated with discovery of subsurface resources as a result of ground disturbing activities.

Cultural resources are subject to review under both federal and state laws and regulations. Section 106 of the NHPA of 1966 empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP. Only cultural resources determined to be significant (i.e., eligible for the NRHP) are protected under the NHPA.

3.2.4 Proposed Action

Archaeological Resources

Since there are no known archaeological sites near the proposed construction area associated with the Proposed Action, there would be no effect on known archaeological resources. Although no archaeological resources have been identified within or immediately adjacent to the project area and the project area is not located in an area of potential concern for archaeological resources, proposed construction has a potential to encounter an unanticipated discovery of subsurface archaeological material due to the need for ground disturbance (i.e., excavation and trenching). Excavation may extend up to 8 ft below existing ground surface for removal of the existing fuel hydrant fueling system, placement of new subsurface structures, and demolition of Buildings 486, 487 and 488.

An unanticipated discovery is defined as one found during a construction project in an area that has already been adequately surveyed or deemed not to require a survey (with SHPO concurrence), and the site in question was not found during that survey. Unanticipated discoveries include the finding of archaeological materials, historic artifacts, or human remains, found when ground-disturbing activities uncover a new site in an area that has already been adequately surveyed.

The likelihood of discovering significant cultural resources such as archeological deposits during implementation of the Proposed Action would be low since nearly all areas proposed for ground-disturbing activities have been previously disturbed for facilities and infrastructure development. To avoid impacts to archaeological resources, the Air Force would ensure that any archaeological deposits discovered during construction activities would be managed in accordance with the compliance procedures described in Section E.13 of the Tinker AFB ICRMP (*Unexpected Discoveries of Archaeological Materials During Construction Projects*) and the provisions of applicable law(s) such as NHPA Section 106 (36 CFR 800.13). The procedural requirement for protection of cultural resources following an unanticipated discovery will be included in project planning requirements.

The Air Force sent a request to the Oklahoma Archaeological Survey for a review of prehistoric resources. No sites are listed as occurring within the area of the Proposed Action, and no archaeological materials are likely to be encountered (Appendix A).

Historic Buildings

No NRHP-listed historic buildings are located within the APE for the Proposed Action as shown on Figure 3-1. The Proposed Action includes activities in the vicinity of two historic buildings constructed in 1942 that have been determined eligible for the NRHP: Building 230 (Airplane Repair Building), and Building 240 (Flight Test Hangar/Base Operations Building). Impacts to these buildings would not occur because there is no requirement for any modifications to these buildings. Construction activities for the replacement of the Type III hydrant fueling system would be restricted to the fueling areas and flight line ramp area as shown on Figure 3-1. None of the proposed activities would: (1) affect the exteriors; (2) affect significant interior features; or, (3) impact character-defining features of these NRHP-eligible buildings. The Proposed Action would not require any modifications to any other buildings in the immediate area of the APE.

The Air Force sent a request to the Oklahoma Archaeological Survey for a review of prehistoric resources (Appendix A). The Air Force has determined that implementation of the Proposed Action would have no effect on Buildings 230 and 240. The Oklahoma Historical Society (State Historic Preservation Office) has found that there are no historic properties affected by the Proposed Action (Appendix A).

Native American Interests

Federally recognized Native American tribes and groups identified at the time of preparation of this document are identified in Subchapter 3.2.2.6. As lead federal agency, the Air Force consulted with these five federally recognized Native American tribes to ensure that any sites of traditional cultural value are identified and adequately considered under the Proposed Action. A copy of the Air Force correspondence to the tribes dated October 7, 2011 is included in Appendix B. No issues or concerns from Native American tribes or groups have been identified at this time.

Native American tribes would be consulted for any post-review discoveries of historic properties, certain or potential materials subject to the Native American Graves Protection and Repatriation Act (NAGPRA), and other Native American cultural resources of interest. Consultation with Native American tribes, if necessary, would be conducted in accordance with procedures outlined in the ICRMP.

For these reasons, the Proposed Action would not result in impacts to Native American interests in the area.

3.2.5 Cumulative Impacts

Cumulative effects on cultural resources would not be expected within the project APE because no historic properties are known in the APE, and the probability is low for inadvertent discoveries of such resources. While cumulative effects analysis considers potential impacts further removed in time, and place, there are no such impacts reasonably predictable for known or expected historic properties outside the APE (such as Buildings 230 and 240).

3.2.6 No Action Alternative

Implementation of the No Action Alternative would have no impact on cultural resources because no construction would occur. Archaeological and historic buildings in the area of the Proposed Action would not change from current conditions.

The potential for adverse effects to Native American resources in the area would continue to be minimized through the Base's ongoing consultation with Native American groups in the Tinker AFB area. For these reasons, the No Action Alternative would not result in impacts to Native American interests in the area.

3.2.7 Mitigation Measures

No mitigation measures would be necessary to avoid or reduce effects to cultural resources.

3.2.8 Best Management Practices

The following best management practices would be incorporated into project planning documents:

- To avoid impacts to archaeological resources, the Air Force would ensure that any archaeological deposits discovered during construction activities would be managed in accordance with the compliance procedures described in Section E.13 of the Tinker AFB ICRMP (*Unexpected Discoveries of Archaeological Materials During Construction Projects*) and the provisions of applicable law(s) such as NHPA Section 106 (36 CFR 800.13). The procedural requirement for protection of cultural resources following an unanticipated discovery would be included in project planning requirements.
- Native American tribes would be consulted for any post-review discoveries of historic properties, certain or potential materials subject to the Native American Graves Protection and Repatriation Act (NAGPRA), and other Native American cultural resources of interest. Consultation with Native American tribes, if necessary, would be conducted in accordance with procedures outlined in the ICRMP.

3.3 GEOLOGIC RESOURCES AND SOILS

3.3.1 Definition of Resource

This section addresses terrestrial earth resources: physiography and geology, soils, and geologic hazards (e.g., earthquakes, liquefaction, landslides and expansive soils). Geologic resources can have economic, scientific, and recreational value, and some can pose hazards to human activities in the affected area.

3.3.2 Existing Conditions

3.3.2.1 Physiography and Geology

Tinker AFB is located in the Central Redbed Plains section of the Central Lowland Physiographic Province which is characterized by level to gently rolling hills, broad flat plains, and bottomlands bisected by small- to medium-sized water courses. Tinker AFB is situated on a broad, relatively high area of uplands that forms a watershed divide.

Oklahoma County elevations range from approximately 850 feet above mean sea level (MSL) in the southeastern part to approximately 1300 feet MSL in the northwestern part. The elevation of Tinker AFB ranges from approximately 1200 feet MSL (Crutcho Creek, northwestern portion of base) to 1310 feet MSL (southeast portion of the base). The airfield elevation is approximately 1291 feet MSL (USAF, 2007).

The surficial geology of Tinker AFB is comprised primarily of sandstone and mudstone (commonly described as shale). Sandstone is orange-red to reddish-brown, fine-grained and poorly cemented. The grains are subangular to sub-rounded and composed of quartz. Mudstone is typically reddish-brown and silty (USAF, 2007).

3.3.2.2 Soils

The soils on Tinker AFB have been altered during industrialization; soil borrowed from on-base areas was used for buildup of facility foundations, leveling portions of the airfield, and the capping of landfills. This has resulted in permanent removal of topsoil and subsoil in some areas (USAF, 2007). Soil compaction is commonplace as the result of off-road training exercises, military construction projects, past aircraft parking, and related activities. Other places have been subjected to extensive filling (USAF, 2005).

The general soil association in the area of the Proposed Action is Kirkland-Urban Land-Renthin, characterized by areas of very deep and deep well drained, clayey soils in areas of urban land, or upon prairie uplands. The soil classification for the area of the Proposed Action is Kirkland-Urban land complex (KrUA) (USAF, 2007).

A soil survey by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in 1983 identified 89 acres of land that were classified as prime farmland[1]. Soil types were reclassified when the soil survey was updated in 1996. Today, approximately 300 acres of land which would have been designated prime farmland has been urbanized and therefore, no longer meets prime farmland criteria (USAF, 2007).

3.3.2.3 Geologic Hazards

Natural geologic hazards are events or processes that have caused, or may cause, hazardous conditions. Examples of natural geologic hazards in Oklahoma include earthquakes, liquefaction, landslides, and expansive soils (Luza and Johnson, 2008).

Earthquakes

Earthquakes frequently occur in three principal areas in Oklahoma: Canadian County; Love, Jefferson and Carter counties; and Garvin and nearby counties. The southeast part of Oklahoma is also an area of low-level earthquake activity. Typical Oklahoma earthquake magnitudes range from 1.8 to 2.5, with shallow focal depths (less than 3 miles).

Earthquake activity in Oklahoma County has been recorded with an intensity of V to VI on the Modified Mercalli (MM) Scale; this corresponds to ground motion that is felt by nearly everyone and with some objects overturned or broken. Earthquakes in Oklahoma County have not exceeded a Richter magnitude of 5.5 in Oklahoma County. Based on mapping of historic earthquakes in Oklahoma (Luza, 2008), there have been no recorded earthquakes with epicenters in the Oklahoma City or the Tinker AFB area. There are, however, earthquake epicenters within Oklahoma County (in the towns of Jones and Luther), and near Norman in Cleveland County.

There are no mapped active earthquake faults in Oklahoma County. Ground shaking from earthquakes associated with nearby and distant faults may occur during the lifetime of the project. Because earthquake-related hazards cannot be totally avoided, the project site could be subjected to mild to moderate seismic ground shaking.

Liquefaction

Liquefaction occurs when loose sand and silt that is saturated with water can behave like a liquid when shaken by an earthquake. For liquefaction to occur, there must be: (1) loose, granular sediment; (2) saturation of the sediment by ground water; and (3) strong shaking (USGS, 2008).

[1] Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the present land use could be cropland, pasture land, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmland has an adequate and dependable moisture supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods of time, and either does not flood frequently or is protected from flooding (USAF, 2007).

At Tinker AFB, the near surface deposits are well consolidated mudstones and sandstones. For this reason the occurrence of liquefaction is highly unlikely.

Landslides

Most landslides in Oklahoma have occurred in the eastern one-third of the state due to wetter climate and steep slopes associated with mountainous terrain (Luza and Johnson, 2008). Tinker AFB is located in an area with a low potential for landslides.

Expansive Soils

Expansive soil, also called shrink-swell soil, is a very common cause of foundation problems. Depending upon moisture in the ground, shrink-swell soils will experience changes in volume of up to thirty percent or more. Foundation soils which are expansive can cause lifting of a building or other structure during periods of high moisture. Conversely during periods of falling soil moisture, expansive soil will collapse and can result in building settlement. Expansive soil will also exert pressure on the vertical face of a foundation, basement or retaining wall resulting in lateral movement. Shrink-swell soils which have expanded due to high ground moisture experience a loss of soil strength or "capacity" and the resulting instability can result in various forms of foundation problems and slope failure (FRG, 2010).

Clay-rich mudstones, or soils from the weathering of mudstones, may contain smectite clay minerals, such as montmorillonite, that swell up to 1.5 to 2.0 times their original dry volume after adding water. Over 75 percent of Oklahoma bedrock units are possible sources for expansive soils. Soil saturation from rainfall, lawn watering, or sewer leakage may cause major damage by soils expanding under sidewalks, highways, utility lines, and foundations. If construction takes place on wet expanded soils, then shrinkage may occur after drying, resulting in severe cracking in structures. Principal geologic units in Oklahoma having high shrink-swell potential include several Permian units in central Oklahoma (Luza and Johnson, 2008). Tinker AFB is considered to have a low-to-moderate abundance of expansive soils. Proper compaction of soil will reduce the risk of instability of soils.

3.3.3 Approach to Analysis

An impact to geological resources and soils would be considered significant if it resulted in substantial erosion or loss of soil, or if permanent alteration of ground surface features resulted from activities such as excavation, drilling, or digging.

3.3.4 Proposed Action

Construction activities associated with the replacement of the Type III hydrant fueling system at Tinker AFB would occur within an area where the physiographic features and geologic resources have been previously disturbed and modified by prior construction of the airfield and supporting facilities. Alteration of ground surface would consist of pavement removal and trenching to install new fuel hydrants and piping. Demolition would be required to remove the existing control building, pump house and pump station. The proposed replacement of the Type III hydrant fueling system would not require any permanent removal of topsoil or the need for extensive fill. No soil-related issues or geologic constraints would be expected.

The proposed replacement Type III hydrant fueling system would be designed and constructed to resist earthquake damage in accordance with applicable design standards and codes. Therefore, the potential impact from strong seismic ground shaking would not be significant.

The proposed Type III hydrant fueling system would be designed and constructed in accordance with engineering standards applicable to soil characteristics at the project site. Section 00 72 00 (*Environmental Requirements for Construction Contracts*) will specify environmental protection and compliance requirements before and during construction for management of natural resources in compliance with applicable Executive Orders and federal, state, Air Force, and Tinker AFB regulations.

Earthwork would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. Best management practices such as single point construction entries would minimize erosion during demolition and construction. Grass and other landscaping would be reestablished in the disturbed areas immediately after construction is completed, thereby reducing the potential for erosion. No permanent alteration of surface features would occur. Therefore, impacts to geologic resources and soils would not be significant.

3.3.5 Cumulative Impacts

Activities with potential to adversely affect geologic resources and soils would be associated with removal of topsoil, alteration of topography or increases in erosion. Although construction of other reasonably foreseeable projects on Tinker AFB would occur at the same time, the Proposed Action would be an in-kind replacement of existing structures with no change in surface features. The Proposed Action would not result in any impacts to geologic resources. Best Management Practices for erosion control would be followed in accordance with construction permit conditions and the SWPPP. For this reason, the Proposed Action would not contribute to cumulative impacts on geologic resources and soils.

3.3.6 No Action Alternative

No ground disturbing activities would occur as a result of the No Action Alternative. Therefore, no impact to physiographic features and soils would be anticipated.

3.3.7 Mitigation Measures

No mitigation measures would be necessary to avoid or reduce impacts to geologic resources or soils.

3.3.8 Best Management Practices

Best Management Practices would be implemented to reduce potentially adverse impacts on geologic resources and soil, or from geologic hazards, as a result of the Proposed Action. The hydrant system would be designed and constructed in accordance with engineering standards applicable to soil characteristics at the project site. BMPs for erosion control would be followed in accordance with construction permit conditions and the SWPPP. Silt fences, compost berms, filter socks or other similar measures would be installed, as appropriate, for managing soil erosion.

3.4 HAZARDOUS MATERIALS AND WASTES

3.4.1 Definition of Resource

Hazardous materials are defined as substances with physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible or incapacitating but reversible illness or may pose a substantial threat to human health or the

environment. Hazardous wastes are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health or the environment.

Issues associated with hazardous materials and wastes typically focus on underground storage tanks (UST); aboveground storage tanks (AST); and the storage, transport, and use of pesticides, bulk fuel, petroleum, oils, and lubricants. When such resources are improperly used, they can threaten the health and well-being of wildlife, habitats, soil systems, water resources, and humans.

To protect habitats and humans from inadvertent and potentially harmful releases of hazardous substances, the DoD requires that all facilities develop and implement Hazardous Waste Management Plans or Spill Prevention and Response Plans. In addition, the DoD has developed the Environmental Restoration Program (ERP), intended to facilitate investigation and cleanup of contaminated sites at military installations. These plans and programs, in addition to established legislation [e.g., Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA)] protect the ecosystems on which most living organisms depend.

Some building components may contain hazardous building materials such as asbestos or lead-based paint (LBP). These substances are hazardous to human health. Consequently, demolition or removal of such components may result in the generation of regulated waste. Regulated waste is transported off site by a licensed contractor for appropriate disposal.

3.4.2 Existing Conditions

3.4.2.1 Hazardous Materials

Hazardous materials are used in processes to perform the mission of Tinker AFB and are managed in accordance with Air Force Instruction (AFI) 32-7086, Hazardous Materials Management, Tinker AFB Supplement (17 December 2009). The Hazardous Materials Management Program (HMMP) manages the procurement and use of hazardous materials at the base. The HMMP functions through the Hazardous Materials Pharmacy, which consists of a decentralized Hazardous Materials Pharmacy Cell and a hazardous materials electronic tracking system known as the Hazardous Materials Management System (HMMS). The HMMS is used to perform the following automated functions:

- Track training, exposure, inventory, and personal protective equipment
- Dispense hazardous materials according to units of use
- Serve as the central issue point for just-in-time control and issue
- Provide online Material Safety Data Sheets
- Maintain hazardous materials control by authorized user, zone, and task

The tracking system also compiles the data necessary to meet reporting requirements, assists in identifying processes for pollution prevention (P2) opportunities, and measures progress in minimizing hazardous materials usage at Tinker AFB (USAF, 2011c).

The Tinker AFB OC-ALC Plan 19-2, Spill Prevention and Emergency Response Plan for Hazardous and Extremely Hazardous Material and Spill Prevention Control and Countermeasures Plan (USAF, 2010), establishes specific procedures for preparing for, and

responding to, inadvertent discharges of oil or releases of hazardous substances at the base, as well as notification and reporting requirements in the event of a release.

Proposed Action Area

Hazardous building materials such as asbestos or LBP may be found in older buildings and structures. The fuel facilities and supply piping for this project were previously surveyed for asbestos and LBP in preparation for demolition. For the enclosed buildings (Facility 487 Control Room Building and Facility 488 oil-water separator) and the open-air facility (Facility 486 Pump Station), asbestos containing building materials were not found. Painted surfaces of these facilities and associated equipment were tested for LBP. LBP was found on fuel filters A19 and A21 and on the discharge valves connected to all (five) fuel filters. Underground piping was not tested and the potential exists that painted underground piping may be coated with LBP.

Other hazardous substances that may be found in buildings or structures to be demolished as part of the Proposed Action include polychlorinated biphenyls (PCB) from old fluorescent light ballasts, transformers and capacitors. Mercury may also be found in old light bulbs and ballasts, light switches and thermostats.

Demolition wastes containing hazardous substances are managed in accordance with Tinker AFB Instruction 32-7004.

3.4.2.2 Hazardous Wastes Generation and Accumulation

Tinker AFB is permitted as a large-quantity hazardous waste generator and holds a Part B permit for its treatment, storage and disposal facility (TSDF) located at Building 810. The permit was issued by the Oklahoma DEQ with an effective date of July 2001. The Oklahoma DEQ serves as the primary oversight agency for RCRA compliance in Oklahoma. The TSDF is operated by the Defense Logistics Agency Disposition Services and is limited to conforming storage (no treatment or disposal). Buildings 810 and 811 store hazardous wastes for up to one year. Containers are then shipped off site for disposal.

Hazardous wastes at the base are managed in accordance with Tinker AFB Instruction 32-7004. The purpose of Tinker AFB Instruction 32-7004 is to ensure safe and effective collection, handling, and disposal of hazardous wastes on the installation in accordance with applicable federal, state, DoD and USAF regulations.

The largest volume of hazardous wastes at the base is generated by aircraft and jet engine maintenance and overhaul activities. These activities include:

- Preparation of aircraft skins and structural members
- Paint removal and application, degreasing, metal etching, and carbon removal from engines
- Abrasive blasting

Conducting these activities requires the use of large volumes of solvents and the generation of dust and liquid wastes. Other hazardous wastes contributing to this waste stream include petroleum products and waste, hydraulic fluid, antifreeze, and mercury-containing light bulbs and ballasts. Disposal of mercury-containing light bulbs must be conducted in accordance with the Universal Waste Rule (40 CFR 273); this rule specifies procedures for proper disposal and storage of used mercury-containing light bulbs and ballasts. The Hazardous Wastes Management program at Tinker AFB has prepared a plan for the replacement of such light bulbs and ballasts

and should be contacted before renovation or demolition activities to ensure the proper handling, management and disposal of these materials.

Another large hazardous waste stream generated at Tinker AFB results from RCRA corrective actions on past contaminated sites and remediation of a National Priorities List site on the base. These wastes consist of solvent-, hydrocarbon-, and metal-contaminated soil and debris removed during remediation projects. Other hazardous wastes at Tinker AFB is generated from remodeling or demolition of older buildings. Due to the age of certain buildings on base, there is a potential for building materials to contain hazardous substances such as asbestos and LBP. Operational activities including vehicle, building, and grounds maintenance, and wastewater treatment also generate hazardous wastes.

Hazardous wastes are accumulated at the site of generation in initial accumulation points (IAP) throughout the base (Figure 3-2). In some areas, collection points are used to accumulate wastes during work shifts; wastes are then transferred to an appropriate IAP at the end of the work shift. Waste staging areas are used for some locations where wastes from multiple IAPs are staged for pickup and transfer to one of two accumulation points (AP), located in Buildings 809 and 3125. Waste containers are tracked from the issue of an empty container through disposal of the container using the HMMS. Building 809 is the largest of the APs and processes the majority of containerized hazardous wastes from the IAPs for transfer to Building 810. Serialized accumulation containers for non-bulk hazardous wastes are issued to waste generators and picked up when full. Waste profiling is completed using either generator knowledge or laboratory analysis to identify and quantify the chemical constituents of the waste for proper treatment and disposal.

There are three areas on Tinker AFB where non-containerized waste is accumulated in APs. The industrial wastewater treatment plant accumulates dewatered hazardous waste sludge in a roll-off bin that is picked up directly by a contractor and taken to an appropriate TSDF. At the AP at Building 3125, drums are rinsed and crushed, aerosol cans are punctured and crushed, and blast media wastes are accumulated. The chemical cleaning line in Building 3001 includes hazardous waste tanks which are only used when there is a malfunction in the process line.

Proposed Action Area

There are no hazardous waste storage areas within the Proposed Action project area, although there are hazardous waste storage areas in nearby facilities (e.g., Buildings 260 and 289).

3.4.2.3 Fuel Storage

The fuels and materials stored and handled in bulk at the base include jet propellant 5 (JP-5), JP-8, and pulverized fuel 1 (PF-1; aviation fuels), JP-10 (missile fuel), motor gasoline (Mogas; automotive gasoline), diesel fuel, biodiesel fuel, No. 2 heating oil, PD-680 (solvent), and deicing fluid. Conoco supplies JP-8 fuel to Tinker AFB through a 6-inch-diameter supply line that enters the northern section of the base and continues to the main tank farm. Tanker trucks are used as a backup to deliver JP-8, which is dispensed to aircraft either from one of the 11 refueler vehicles (R-11s) or directly through hydrants located on the aprons.

Various fuels at the base are also stored in aboveground storage tanks (AST) and underground storage tanks (UST). Tinker AFB currently maintains 36 active USTs and 90 active ASTs.

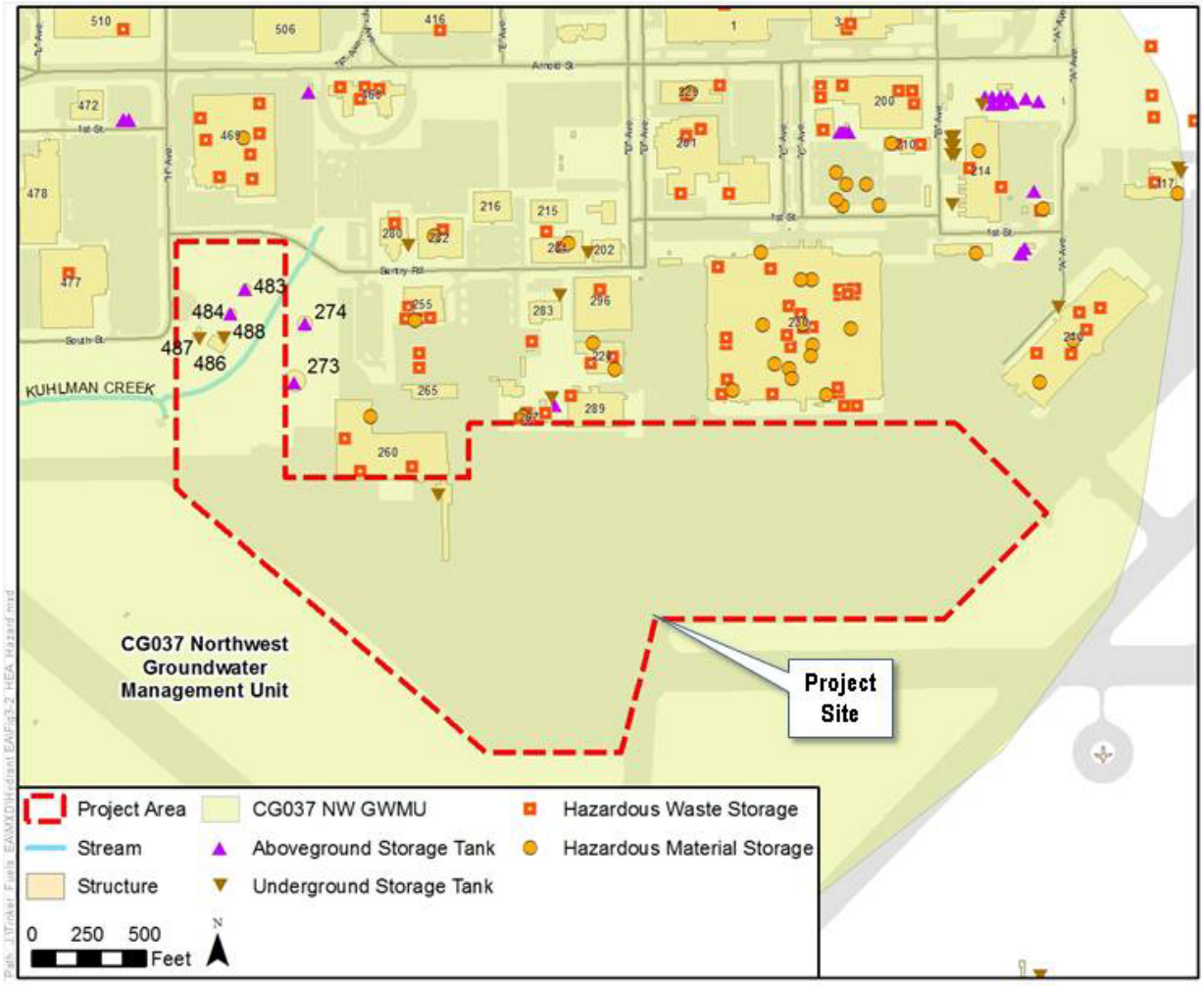

Figure 3-2. Hazardous Waste and Hazardous Material Storage Sites on Tinker AFB

Releases from ASTs and USTs (i.e., spills, overfill, and leaks) can cause fires or explosions that threaten human safety and can contaminate soil and groundwater that threaten human health. To protect groundwater and soil from contamination, the storage tank program at Tinker AFB implements the following:

- All ASTs must meet applicable requirements, including requirements for leak testing and preventing, responding to, reporting, and cleaning up spills.
- New USTs (including piping) must be designed and constructed to provide corrosion protection, release detection, spill and overfill prevention, proper installation, and secondary containment.
- All existing USTs (any regulated UST installed before December 22, 1988) must be upgraded to meet the standards for new USTs.
- New ASTs must be designed to meet the requirements of 40 CFR §280.11 to prevent releases for the operational life of the system.

OC-ALC Plan 19-2 includes the Spill Prevention, Control and Countermeasures (SPCC) Plan required under Title 40, Code of Federal Regulations, Part 112 (Oil Pollution Prevention) for fuel storage facilities.

Abandoned and active USTs at Tinker AFB were investigated beginning in September 1985. Eighty-eight active tanks and 38 abandoned tanks were identified and located. Most of those tanks were found in the vicinity of Building 3001 and in the north-central portion of the base near Building 201, Building 210, and the B290 Fuel Farm. In coordination with the Oklahoma Corporation Commission (OCC), Tinker AFB began release investigations at 26 UST sites beginning on July 31, 1999. Tinker AFB has completed most of the investigations and has determined the nature and extent of contamination at each UST site; several of those sites are in active remediation. Currently, 15 of the sites have been closed or deactivated in accordance with OCC regulations that were in effect before September 1, 1996. The previous rules categorized UST sites for remediation based on generic contaminant levels in soils and groundwater. On July 1, 1996, the OCC issued new rules that classify sites for remediation based on risk to human health and the environment. The new process is referred to as the Oklahoma Risk-Based Corrective Action Program. Eleven sites are still open and are in remediation or have been recommended for case closure. In addition, two UST removals were performed in 1998, and tank closure reports were submitted to the OCC in December 1998 for each site. According to the Fiscal Year 2009 *Internal ECAMP Final Report*, Tinker AFB currently maintains 36 active USTs and 90 active ASTs (USAF, 2011c).

Proposed Action Area

There are two ASTs in the Proposed Action area. The two 10,000 barrel, JP-8 ASTs (Tank 483 and Tank 484) associated with the hydrant fueling system would be refurbished as part of the Proposed Action. The two tanks' bottom seals and tank gauges would be replaced and a floating pan would be added to one of the tanks (the other tank already has a floating pan). Two other tanks (Tank 273 and Tank 274) located southeast of Tanks 483 and 484 are not part of the Proposed Action and would remain as is.

3.4.2.4 Groundwater Contamination

Tinker AFB has established a basewide groundwater sampling program to obtain depth-to-water and depth-to-product measurements semiannually from approximately 1,300 monitoring wells, pumping wells, and piezometers (a small-diameter observation well used to measure groundwater pressure). Groundwater at Tinker AFB is evaluated and monitored in areas where solvents or other hazardous materials may have been disposed of and have impacted groundwater.

Three consolidated groundwater management units (GWMU), identified as the Northwest, East and Southwest GWMUs, are located within the boundaries of Tinker AFB. The purposes of the GWMUs are to define areas to facilitate investigation and monitoring of groundwater for contaminants, principally solvents, metals and fuel that may originate from a variety of localized sources. The sources include several Installation Restoration Program (IRP) sites and non-IRP sites at Tinker AFB, including the Soldier Creek/Building 3001 National Priorities List (NPL) site located east of the Proposed Action Area. Remedial actions in place include pump-and-treat systems, monitored natural attenuation, and interim controls.

Soil vapor at Tinker AFB results from the evaporation of petroleum products, solvents, or other hazardous materials remaining in the unsaturated soils found below the ground surface (above groundwater level). Vapor intrusion assessments were recently performed to assess the potential for soil vapor intrusion of subsurface contaminants volatilized from soil and/or groundwater into overlying buildings at various areas across Tinker AFB. It was determined that the potential for soil vapor intrusion exists for several buildings at Tinker AFB. However, the assessment concluded that soil vapor intrusion is likely to be a rare occurrence at Tinker AFB because of the clay-rich soils underlying most buildings.

Proposed Action Area

The Proposed Action area is within the northwest GWMU (CG0037) (Figure 3-3). The principal chemicals of concern in the northwest GWMU include chlorinated solvents such as trichloroethane (TCE). According to 2007 groundwater sampling information, TCE concentrations exist in the upper and lower saturated zones under the following buildings in the northwest GWMU: 200, 201, 202, 220, 230, 240, 255, 260, 267, 268, 283, 289, and 296. Buildings closest to the Proposed Action area are 230, 260, 267 and 289.

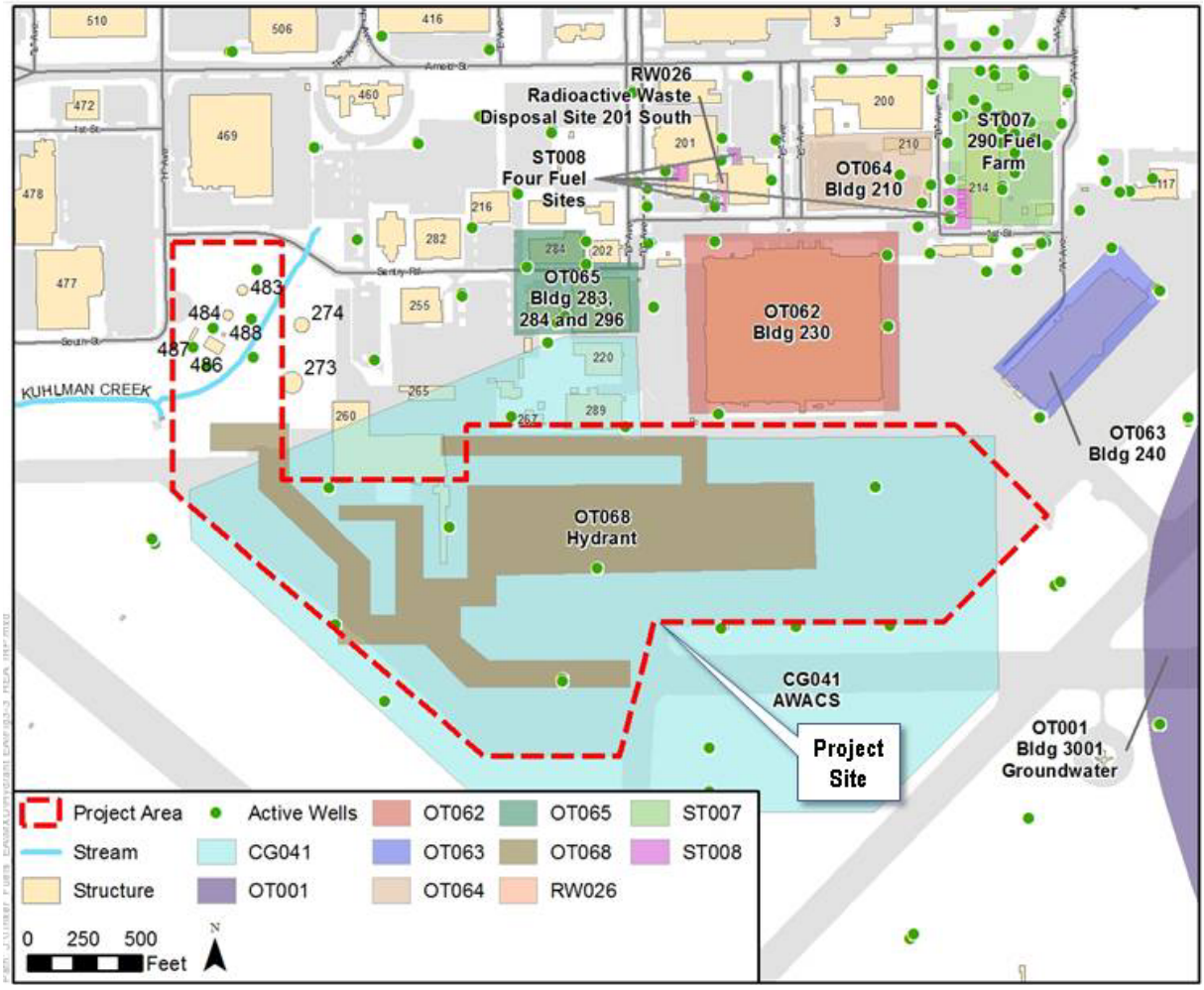

Figure 3-3. IRP Sites in the Proposed Action Area

3.4.2.5 Environmental Restoration Program

The DoD Environmental Restoration Program (ERP) was established in 1981 to investigate and remediate hazardous waste sites at DoD facilities. The Air Force subsequently established its ERP to locate and investigate hazardous waste sites on its installations, termed Installation Restoration Program (IRP) sites. Fully restored and remediated IRP sites present few constraints to future on-base development; however, the implementation of land use controls may be required. Land use controls are physical, legal, or administrative mechanisms that restrict or limit access to contaminated property to promote beneficial land uses and to protect human health and the environment.

A total of 40 IRP sites including National Priorities List sites (operable units), landfills, industrial waste pits, fire-training areas, radioactive waste disposal sites, disposal areas, and groundwater contamination sites have been identified on Tinker AFB. Of the 40 sites in the IRP, 24 have reached site closeout with the regulating authority while the remaining 16 sites have a remedy in place. All of the IRP sites in the Proposed Action area are RCRA corrective action sites and regulated by the Oklahoma DEQ.

In addition to the IRP sites, 13 Air Force Compliance Restoration Program (CRP) sites are located on Tinker AFB. All of the CRP sites are RCRA corrective action sites which will require site investigations, studies, or other evaluations before further remedial action can be proposed and implemented. There are five active Military Munitions Response Program (MMRP) sites on Tinker AFB, but none are in the Proposed Action area.

Proposed Action Area

There are three existing IRP and six proposed CRP sites in the area of the Proposed Action (Figure 3-3). These sites are listed in Table 3-10.

Table 3-10. IRP Sites in the Proposed Action Area

No.	Site Type	Status
1	Storage Tanks (ST) 007 290 Fuel Farm	Remedial Action - in Operation
2	ST008 Four Fuels Site	Long Term Monitoring, Natural Attenuation
3	Radioactive Waste (RW) 026 Radioactive Waste Disposal Site 201 South	Site Closed - No Further Action
4	Contaminated Groundwater (CG) 041 AWACS Sector	Proposed
5	Other (OT) 062 Building 230	Proposed
6	OT063 Building 240	Proposed
7	OT064 Building 210	Proposed
8	OT065 Buildings 283, 284 and 296	Proposed
9	O068 Hydrant	Proposed

3.4.3 Approach to Analysis

Numerous local, state, and federal laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect public health and the environment. The significance of potential impacts associated with hazardous substances is based on their toxicity, ignitability, reactivity, and corrosivity. Impacts associated with hazardous materials and wastes would be significant if the storage, use, transportation, disposal of, or interaction with hazardous substances substantially increases the human health risk or environmental exposure.

3.4.4 Proposed Action

Construction-Related Impacts

Implementation of the Proposed Action includes the removal of equipment and associated piping and ramp pavement and the demolition of existing support structures. Asbestos containing materials were not found at any of the facilities to be demolished during a previous survey. However, LBP was found on two fuel filters and the discharge valves to all five fuel filters. Underground piping was not tested for LBP and could potentially be coated with LBP.

Cutting, grinding, scraping, burning or any other manner of removing LBP from painted surfaces that would result in creating lead dust is regulated. Equipment and piping containing LBP would be removed by unbolting them instead of cutting them to avoid generating lead dust.

Other hazardous substances that may be found in the buildings and structures to be demolished could include PCB and mercury. PCB may be found in old fluorescent light ballasts, transformers and capacitors. Mercury may be found in old light bulbs and ballasts, light switches and thermostats.

Contractors constructing the replacement hydrant fueling system may bring hazardous materials on site. These may include lubricants, coatings, and solvents.

The project area is known to have soil and groundwater contamination from past fuel releases. Any contaminated soil from trenching or excavation would be tested prior to disposal. Ongoing investigations at proposed CRP sites and cleanup at nearby IRP and CRP sites would continue during construction of the Proposed Action. The Proposed Action would not include remediation of contaminated soil. A separate SRM project would be funded for containment, removal, remediation efforts for this project.

Regulated waste such as those described above would be contained and disposed in accordance with all applicable standards by a licensed contractor. In addition, construction contractors would be required to comply with Section 00 72 00, *Environmental Requirements for Construction Contracts*. Compliance with applicable requirements would result in negligible impacts from exposure to hazardous substances during demolition of existing facilities and construction of the new facilities.

Operational Impacts

Operations associated with the Proposed Action would not result in the generation or disposal of hazardous materials or wastes in the Proposed Action project area. The likelihood of spills from the transfer of fuel using refueler trucks would be eliminated when the new hydrant fueling system is operational. Ongoing investigations at proposed CRP sites and remediation at nearby IRP and CRP sites would not be impeded during the use and operation of the new hydrant fueling system. Therefore, there would be no adverse impacts on or from hazardous materials or wastes or contaminated sites during operation of the Proposed Action.

3.4.5 Cumulative Impacts

Activities with potential to adversely affect water resources would be associated with inadvertent spills of hazardous substances. The Proposed Action would result in a decrease in the likelihood of FUEL spills from the transfer of fuel using refueler trucks. The potential for fuel spills would be eliminated when the new hydrant fueling system is operational. For this reason, the Proposed Action would not contribute to cumulative impacts on hazardous materials and hazardous wastes.

3.4.6 No Action Alternative

If the No Action Alternative were selected, Tinker AFB would not implement the Proposed Action. Therefore, no impacts with regard to hazardous materials would occur and current conditions would continue.

3.4.7 Mitigation Measures

No mitigation measures would be necessary to avoid or reduce any adverse hazardous substances or hazardous waste impacts.

3.4.8 Best Management Practices

Best management practices would be implemented during construction as required in Contract Specification Section 00 72 00 to prevent or minimize potential impacts from hazardous substances and hazardous wastes. Regulated waste such as asbestos containing materials, lead-based paint, PCB and mercury would be contained and disposed in accordance with all applicable standards by a licensed contractor.

3.5 WATER RESOURCES

3.5.1 Definition of Resource

Water resources include surface and groundwater resources (including the quality and availability of surface and groundwater), wetlands, and floodplains. Surface water resources comprise lakes, rivers, and streams and are important for a variety of reasons including economic, ecological, recreational, and human health. Groundwater comprises the subsurface hydrologic resources of the physical environment and is an essential resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition (USAF, 2011c).

Wetlands are defined by the USACE and the EPA in 33 CFR 328.3(b) as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. As defined in 1984, wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands provide a variety of functions, including groundwater recharge and discharge, flood flow attenuation, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, aquatic and terrestrial diversity and abundance, and uniqueness. Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act; Executive Order 11990, *Protection of Wetlands*, requires analyses of potential wetland impacts if they are related to proposed federal actions.

Other issues relevant to water resources include watershed areas affected by existing and potential runoff and hazards associated with 100-year floodplains. Most of the watersheds on Tinker AFB property have been developed into residential or industrial areas, airfield, and the golf course with only some small areas remaining undeveloped (USAF, 2007).

Floodplains are corridors of low, level ground on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by floodwater. Inundation dangers associated with floodplains have prompted federal, state, and local legislation that limits development in these areas largely to recreation and preservation activities. Executive Order 11988, *Floodplain*

Management, requires actions to minimize flood risks and impacts. Under this order, development alternatives must be considered and building requirements must be in accordance with specific federal, state, and local floodplain regulations. The DoD has implemented storm water requirements under Section 438 (42 USC §17094) of the EISA to maintain the hydrologic functions of a site and mitigate the adverse impacts of storm water runoff from DoD construction projects. Section 438 requires federal facility projects of more than 5,000 square feet to "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow" (DoD, 2010).

Surface water features, including wetlands and floodplains, found on Tinker AFB and surrounding communities are shown on Figure 3-4.

3.5.2 Existing Conditions

Surface Water

Oklahoma County's landforms drain into the North Canadian River, which runs west to east through the county. The northern portion of the county drains into the Crutcho Creek drainage basin and into the North Canadian River, and the southern portion drains into the Elm Creek and Hog Creek drainage basins and into the South Canadian River; both rivers are headwaters for the Arkansas River. The entire county is part of the Arkansas River Basin.

Several drainage corridors traverse Oklahoma County close to Tinker AFB, including Brock Creek, East Elm Creek, Crutcho Creek, West Hog Creek, the East Fork and West Fork of Wildhorse Creek, Bluff Creek, Walnut Creek, and Soldier Creek. Surface waters on Tinker AFB occur in three primary drainage basins, one of which drains to the north (Crutcho Creek with Kuhlman and Soldier Creek tributaries) and two to the south (East Elm Creek and West Hog Creek). Most of Tinker AFB is drained by the Crutcho Creek drainage basin, which flows to the north into the North Canadian River. The Elm Creek and Hog Creek drainage basins flow to the south of the base into the Little River, which forms a confluence with the South Canadian River. Most base creek flows are the result of storm water runoff, although portions of the creeks are recharged from groundwater. Storm water runoff is collected by diversion structures and discharged into surface streams (USAF, 2007). No significant point-source industrial discharges currently are made into any waterway on Tinker AFB (USAF, 2007).

The 2007 Tinker AFB Storm Water Pollution Prevention Plan (SWPPP) complies with the conditions of the Multi-Section General Permit for Storm Water Discharges Associated with Industrial Activities (Permit Number GP-00-01). The SWPPP is a supporting plan in OC-ALC Plan 19-2. The SWPPP provides basewide and facility-specific BMPs to reduce pollutants in storm water discharges from the base. BMPs for Tinker AFB include source controls, management practices, preventive maintenance, spill prevention and response, erosion and sediment controls, and the identification of storm water pollution prevention personnel.

Groundwater

The primary subsurface water zones identified at Tinker AFB include the Hennessey water-bearing zone, the upper saturated zone (formerly the "perched" zone), the lower saturated zone (formerly the "top of regional" and "regional" aquifers), and the producing zone. Tinker AFB is located in a recharge area for these water-bearing zones; groundwater is derived primarily from precipitation and from infiltration of surface streams (USAF, 2007).

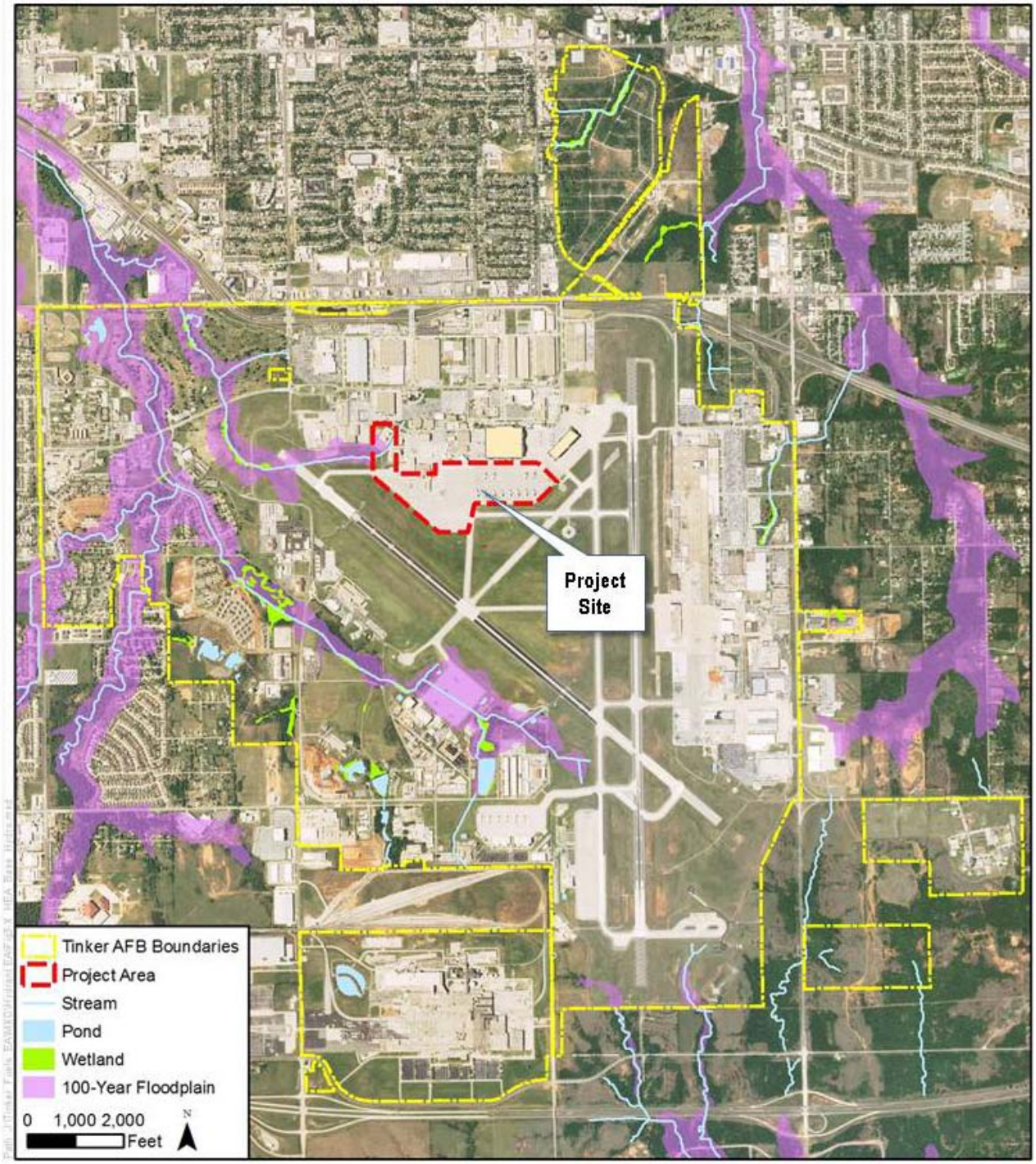

Figure 3-4. Surface Water Resources on Tinker AFB

Tinker AFB lies within the recharge area of the Garber-Wellington Aquifer. Regional groundwater flow under Tinker AFB ranges in direction from west/northwest to southwest, depending on location, and has a gradient between 10 to 30 feet per mile (USAF, 2007). The Hennessey water-bearing zone overlies this aquifer in the southwestern portion of the base, but it is not part of the Garber-Wellington Aquifer. Groundwater at Tinker AFB is found under either water table or confined conditions. The depth to water ranges from a few feet to about 70 feet

depending on the local topography. Across Tinker AFB, water can sometimes be found in shallow, thin, discontinuous perched zones above the aquifer. However, on Tinker AFB some contaminated groundwater plumes exist typically at a depth of 175 feet or shallower. These plumes do not pose health concerns at this time since the producing zone at Tinker AFB (i.e., depth at which water from supply wells is obtained) is 200 feet or deeper. Also, there appears to be an aquitard, or hydraulically confining lithologic layer, at approximately 200 feet, which hydraulically separates the producing zone from shallower groundwater in the aquifer at Tinker AFB (USAF, 2007). More than 1,300 monitoring wells, production wells, and piezometers have been installed in support of the Tinker AFB ERP monitoring (see Subchapter 3.4, *Hazardous Materials and Wastes*).

Wetlands

In 1995, approximately 65 acres of wetlands were identified on Tinker AFB by USFWS using National Wetland Inventory (NWI) criteria; these wetlands included creeks, ponds, drainage swales, and other wet areas (USAF, 2007). Of the 65 acres, 7.9 acres were later classified by the USACE as jurisdictional wetlands under the Clean Water Act. In 2002, the 65 acres of wetlands (73 wetland areas) were reassessed to track their status and trend. Based on the survey, only two wetlands (i.e., the Urban Greenway and Prairie Pond) were classified as high-quality wetlands. Thirty-four were classified as being of intermediate quality, and six were classified as low quality. This study also determined that 31 of the original 73 NWI wetland areas no longer existed or were actually drainage ditches or wet-weather conveyances that did not function as wetlands or aquatic habitat and therefore were not included in the survey. These nonwetland areas covered approximately 27 acres and most were within the airfield or other highly industrialized areas of the base. Therefore, the current total NWI acreage on Tinker AFB is estimated at 38 acres. As of 2007, these had not been officially "delisted" as wetlands by the USFWS, which conducted the original study (USAF, 2007).

Floodplains

The flood hazard areas of Oklahoma County are subject to periodic inundation that results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect public health, safety, and general welfare. The bulk of 100-year and 500-year floodplains designated by the Federal Emergency Management Agency for Oklahoma County are along the North Canadian River and its major tributaries.

In October 2002, the U. S. Army Corps of Engineers, Southwestern Division-Tulsa District, completed a study for the Air Force to update the 100-year and 500-year floodplains at Tinker AFB. Crutcho Creek, its tributaries, and Kuhlman Creek are bounded by 100-year and 500-year floodplains. These floodplains affect approximately 121 acres of land on Tinker AFB. The bulk of these floodplains are located along Crutcho Creek.

In general, the function of 100-year floodplains on Tinker AFB is poor. However, conversion of some floodplains in improved and semi-improved grounds to natural areas in recent years has helped to develop the functions of these areas. Although no specific monitoring of floodplain functions has been accomplished in the past, projects are scheduled to provide the foundational data for measuring progress towards development of healthy floodplains on Tinker AFB (USAF, 2007).

3.5.2.1 Proposed Action Area

Surface Water

Areas included in the Proposed Action include the easternmost watershed boundary of Kuhlman Creek (Figure 3-5). Kuhlman Creek is a tributary to Crutcho Creek which drains to the north. Stream flows are generated primarily by precipitation runoff. As an intermittent creek, Kuhlman Creek has constant flow through human influence.

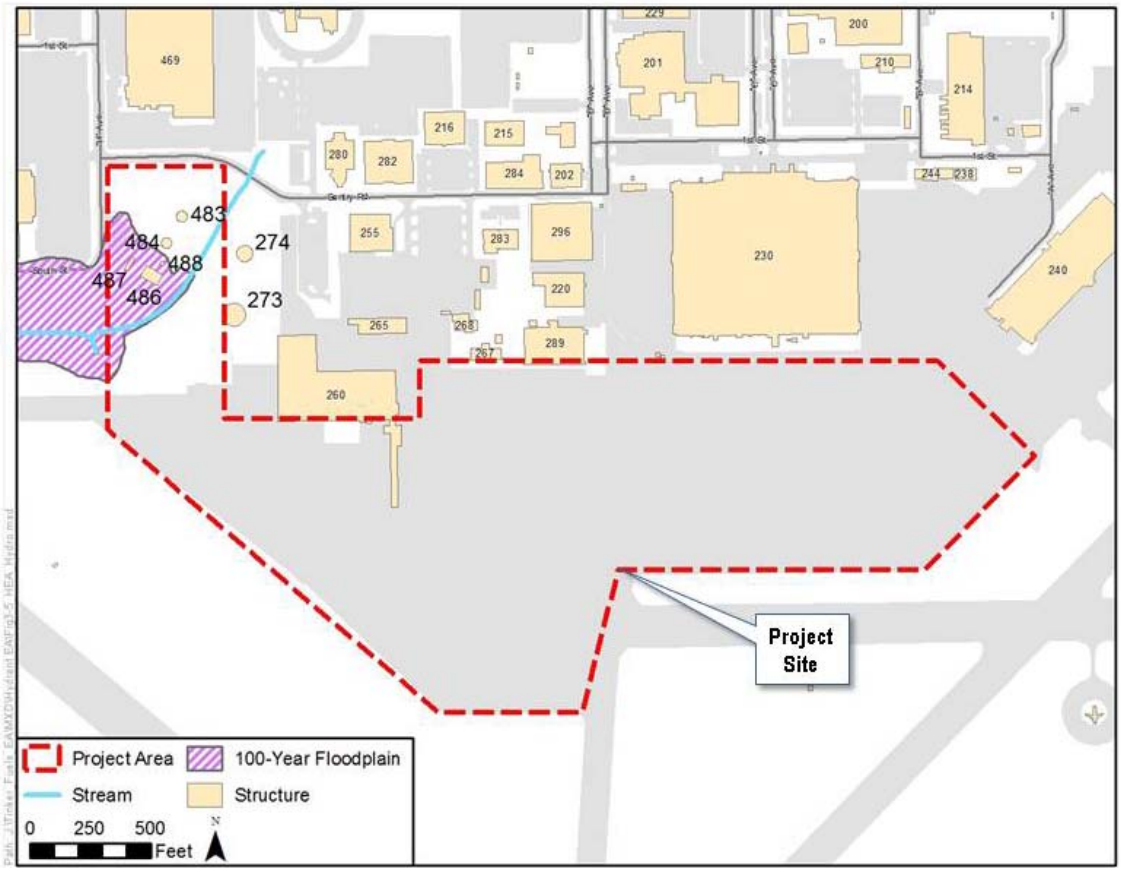

Figure 3-5. Surface Water Features in the Area of the Proposed Action

Groundwater

The approximate direction of groundwater flow in the Garber-Wellington Aquifer is west to northwest across the northern half of Tinker AFB. Shallow groundwater may discharge into surface streams or be recharged by streams. Most water from the Garber-Wellington Aquifer is of sufficient quality to be used for most industrial, agricultural or domestic purposes. However, some contaminated groundwater plumes do exist typically at a depth of 175 feet or shallower. These plumes are primarily a result of aircraft maintenance and overhaul operations that occurred between the mid-1940s and mid-to-late1970s. These operations required the use of solvents and involved activities such as chrome plating which by various means led to contaminants entering the groundwater. Leaking fuel tanks and inappropriate waste disposal practices also contributed to the plumes (USAF, 2007). Additional information on groundwater contamination is provided in Subchapter 3.4.2.4.

Wetlands

Based on data from the *Integrated Natural Resources Management Plan* (USAF, 2007) and geospatial data provided by Tinker AFB, there are no wetlands in the area of the Proposed Action. The area that would be subject to construction includes the aircraft apron and the area to the west where the two existing JP-8 fuel tanks, control building and pump house are located.

Floodplains

The proposed area for replacement of the Type III hydrant fueling system includes the 480 Tanks Area northwest of the 552 ACW aircraft refueling area. Buildings 486, 487 and 488 are located within the mapped floodplain of Kuhlman Creek on the north-central portion of the base, north of the airfield (Figure 3-5). No other portions of the Proposed Action area are within floodplains. In areas near the floodplain, activities associated with the Proposed Action would be confined to previously disturbed areas, such as existing paved areas.

3.5.3 Approach to Analysis

Significance criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. An impact on water resources would be significant if it would: (1) reduce water availability to or interfere with the supply of existing users; (2) create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources; (3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; (4) threaten or damage unique hydrologic characteristics; or, (5) violate established laws or regulations that have been adopted to protect or manage water resources of an area including wetlands. Impacts of flood hazards on a project would be significant if such actions are proposed in areas with high probabilities of flooding.

3.5.4 Proposed Action

Surface Water

Implementation of the Proposed Action would involve ground-disturbing activities that could increase the potential for soil erosion during construction:

- Replacement of the fuel hydrants would involve demolition and construction primarily within the existing paved area. Due to the distance of the fueling apron from Kuhlman Creek, it is unlikely that adverse impacts on surface water quality (e.g., silt-laden runoff discharge into the creek) would result.
- Construction activities (demolition of Buildings 486, 487 and 488 as well as trenching to install replacement piping for the new pump house) in the 480 Tanks Area northwest of the airfield would require ground disturbance near Kuhlman Creek.

Potential impacts to Kuhlman Creek from construction in the 480 Tanks Area would be minimized through implementation of existing nonpoint pollution requirements and spill prevention and response procedures. A Storm Water General Permit for Construction Activities (Permit No. OKR10), issued by the Oklahoma DEQ, would be required. In addition, implementation of BMPs such as silt fencing and vegetation-based erosion control measures would minimize construction impacts. Long-term operations of the system would not affect surface water; therefore, under implementation of the Proposed Action, no long-term adverse impacts on surface water resources are anticipated.

Groundwater

It is unlikely that groundwater quality would be adversely affected by the Proposed Action, assuming required controls for the handling of hazardous materials and spill prevention and cleanup are implemented properly.

Implementation of the Proposed Action would result in no net change in impermeable surfaces from the installation of new hydrants and the construction of a new control building. Further, the Proposed Action would not be a water user or wastewater generator. The footprint of the Proposed Action is negligible with regard to groundwater area below the region. Groundwater monitoring wells would not be affected. Therefore, implementation of the Proposed Action would result in negligible impacts on groundwater resources.

Wetlands

No wetlands exist at or adjacent to the location of the Proposed Action. The proposed replacement of the Type III hydrant fueling system would not involve any disturbance or removal of any wetlands. Therefore, construction of the Proposed Action would have no effect on wetland resources; no permanent impacts on wetlands would occur.

Floodplains

In accordance with Executive Order 11988, *Floodplain Management*, the Air Force has considered development alternatives that meet the need for this action. The Air Force would also incorporate building requirements to minimize flood risks and impacts, including implementation of storm water requirements under Section 438 (42 USC §17094) of the EISA to maintain the hydrologic functions of a site and mitigate the adverse impacts of storm water runoff from DoD construction projects. Section 438 requires federal facility projects of more than 5,000 square feet to "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow" (DoD, 2010).

The proposed replacement of the Type III hydrant fueling system would include construction in the 480 Tanks Area northwest of the 552 ACW aircraft refueling area. The Proposed Action would include demolition of three small buildings which are located within the mapped floodplain of Kuhlman Creek (Figure 3-5). As shown on Figure 2-2, a portion of the mapped floodplain is near existing JP-8 fuel storage tank (Tank 484) however, flood water would not be expected to exceed the height of the existing containment berm surrounding this tank. No other portions of the Proposed Action area are within floodplains.

Construction activities within the floodplain associated with Kuhlman Creek would include: demolition of Buildings 486, 487 and 488, construction of a new pump house, and trenching to install replacement piping for the new pump house. While the footprint of Tanks 483 and 484 (including secondary containment) would not be altered and the existing containment berms would not change, the area of construction for the new pump house and control room would be 4,456 square feet in size. Demolition and construction activities for the pump house and control room in the 480 Tanks Area would occur primarily in previously disturbed areas. The proposed replacement of these structures should not result in any change in the elevation, function, or capacity of the existing floodplain, since activities would only involve short-term construction and installation of underground fuel piping. Following installation, the piping would be buried and the ground surface would be returned to its current condition (e.g., elevation, topography,

ground cover). Therefore, implementation of the Proposed Action would have temporary negligible impacts on the Kuhlman Creek floodplain in the 480 Tanks Area; no permanent impacts would occur.

3.5.5 Cumulative Impacts

Activities with potential to adversely affect water resources would be associated with disturbance to surface water, groundwater, and wetlands, or alteration of floodplains. Although construction of other reasonably foreseeable projects on Tinker AFB would occur at the same time, the Proposed Action would be constructed to avoid disturbance to Kuhlman Creek. Best Management Practices for erosion control would be followed in accordance with construction permit conditions and the SWPPP. No change to groundwater recharge would occur as a result of the Proposed Action. There are no designated wetlands in the construction area of the Proposed Action. The proposed replacement of the Type III hydrant fueling system would not result in any change in the elevation, function, or capacity of the existing floodplain associated with Kuhlman Creek, and the ground surface would be returned to its current condition after construction. For these reasons, the Proposed Action would not contribute to cumulative impacts on surface water, groundwater, wetlands or floodplains.

3.5.6 No Action Alternative

If the No Action Alternative were selected, proposed construction activities would not be implemented and water resources conditions would remain unchanged from their current status, as described in Subchapter 3.5.2.

3.5.7 Mitigation Measures

No mitigation measures would be necessary to avoid or reduce any adverse impacts to water resources (surface and groundwater, wetlands or floodplains).

3.5.8 Best Management Practices

Best Management Practices would be implemented in order to reduce potentially adverse impacts on water resources as a result of the Proposed Action. The SWPPP provides base-wide and facility-specific BMPs to reduce pollutants in storm water discharges from the base. The contractor would control storm water and wastewater during construction activities by implementing the following measures:

- Obtain Storm Water General Permit for Construction Activities – Permit No. OKR10 issued by Oklahoma DEQ.
- Minimize the total amount of ground disturbance and preserve vegetative cover to the amount practicable.
- Install silt fence, compost berms, or filter socks or other similar measures for managing storm water runoff.
- Limit construction staging areas to previously disturbed areas.
- Service and refuel equipment away from streams, and ensure all chemicals and petroleum products are stored and contained away from water sources.

3.6 INDIRECT IMPACTS

While direct environmental effects, as evaluated in this EA, are caused by the action and occur at the same time and place, indirect effects are those effects caused by the action that occur at a later time or are farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to the induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

The Proposed Action would result in an increase in the efficiency associated with fueling and defueling of aircraft based at Tinker AFB. A decrease in the number of personnel involved in fueling operations would also occur. Indirect effects on land use, population density or growth rate, air quality and ecosystems would not be expected.

3.7 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be considered significant.

3.7.1 Noise

The noise that would result from demolition and construction of the replacement Type III hydrant fueling system is an unavoidable condition. These activities may result in intermittent periods of increased noise levels. Sleep disturbance, hearing impairment, and structural damage would not be expected to occur as a result of construction noise associated by the Proposed Action because there are no residents in the affected area that would be subject to construction noise. Noise from demolition and construction may result in temporary periods of annoyance and speech interference for personnel in the immediate area only.

3.7.2 Air Quality

Generation of air pollutant emissions resulting from demolition and construction is an unavoidable condition. These activities may result in intermittent periods of increased air pollutant emissions at the work site. The Air Force would ensure that emissions are minimized by site watering and that all hazardous emissions are managed in accordance with applicable regulations. Air pollutant emissions generated by the Proposed Action would not be considered a significant impact to air quality.

3.7.3 Energy

The energy impacts associated with continued operation of the Type III hydrant fueling system involve the use of petroleum-based products (such as gasoline, diesel and jet fuel) and electricity, none of which are in short supply. The continued use of fossil fuels, a nonrenewable natural resource, by the Proposed Action would be considered an unavoidable adverse impact. The Proposed Action would result in a reduction in the use of diesel by refueler trucks over baseline conditions; a potential increase in the use of electricity (derived from natural gas combustion) for the operation of pumps to send fuel to the additional hydrants would also occur. The use of nonrenewable resources is unavoidable, although not considered significant.

3.8 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The Proposed Action would not result in an intensification of land use on Tinker AFB or in the Oklahoma City area and vicinity. Implementation of the Proposed Action or the No Action Alternative would not result in loss of open space. The site for replacement of the Type III hydrant fueling system has been designated for industrial use, and was not planned for long-term open space or other use. Therefore, it is not anticipated that the Proposed Action or the No Action Alternative would result in any cumulative land use or visual resources impacts. Long-term productivity of the area would not be affected by the Proposed Action.

3.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, and human resources. The use of these resources is considered to be permanent.

3.9.1 Energy Resources

Energy resources utilized for construction and operation of the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline, diesel and jet fuel), natural gas, and electricity. The Proposed Action would result in no change in the amount or use of jet fuel for ongoing aircraft operations at Tinker AFB. Natural gas and electricity would continue to be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts on energy resources would be expected.

3.9.2 Human Resources

The use of human resources for the construction and operation of the new Type III hydrant fueling system is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action would result in improvements in aircraft fueling and defueling operations on Tinker AFB, and is considered beneficial.

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CHAPTER 4
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CHAPTER 5
LIST OF PREPARERS

The following persons and agencies were consulted during preparation of this EA:

Air Force Center for Engineering and the Environment

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John Rucci (72 LRS)

The following persons were responsible for preparation of this EA:

Name	Degree(s)	Resource	Years of Experience
Parsons			
Crisologo, Rosemarie	B.S., Biological Sciences M.S., Environmental Engineering	NEPA Analysis; Cultural Resources; Geologic Resources and Soils; Water Resources.	25
Gaddi, Elvira, P.E.	B.S., Chemical Engineering M.S., Chemical Engineering	Air Quality and Greenhouse Gas Emissions; Hazardous Wastes and Hazardous Materials.	29
Marfori, Liza	B.S., Chemical Engineering	Project Management	20
Osweiler, John	B.S., Geology	Technical Advisor	35
Saldana, Tim, GISP	B.S., Geographic Information Systems M.A.G., Geographic Information Systems	GIS Program Manager	19

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APPENDIX A

AGENCY CONSULTATIONS AND PUBLIC INVOLVEMENT

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AGENCY CONSULTATIONS AND PUBLIC INVOLVEMENT

A.1 AGENCY CONSULTATIONS

Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, provides the procedures to comply with applicable federal, state, and local directives for Interagency and Intergovernmental Coordination for Environmental Planning (IICEP). The AFI implements the following:

- Air Force Planning Document 32-70, *Environmental Quality*;
- Department of Defense (DoD) Directive 4165.61, Intergovernmental coordination of DoD Federal Development Programs and Activities;
- Executive Order 12372, Intergovernmental Review of Federal Programs;
- Title IV of the Intergovernmental Coordination Act (ICA) of 1968; and
- Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

Section 401(b) of the ICA states that, "All viewpoints-national, regional, state, and local…will be fully considered…when planning federal or federally assisted development programs and projects."

Air Force planners determined that for purposes of public participation under 36 CFR §800.2(d) and 800.8(a)(1), distribution of this EA for public comment offered the public a reasonable opportunity to engage the Air Force under provisions of NHPA Section 106.

A.2 NOTIFICATION OF THE AVAILABILITY OF THE DRAFT ENVIRONMENTAL ASSESSMENT

The *Air Force Environmental Impact Analysis Process* (32 CFR 989), 15 Jul 99, and amended 28 Mar 01, states that an environmental assessment and Finding of No Significant Impact should be made available to agencies and the public for comment. Notices announcing the 30-day public comment period and the availability of the Draft EA and Draft FONSI/FONPA were published in the Daily Oklahoman and the Tinker Takeoff newspapers on November 10, 2011. A copy of these notices is included in this appendix.

A.3 DISTRIBUTION OF THE DRAFT ENVIRONMENTAL ASSESSMENT

Copies of the Draft EA were placed in the following library for public review:

Metropolitan Library System Midwest City
8143 E. Reno Avenue
Oklahoma City, OK 73110-7589

The Draft EA was provided to the following 25 agencies and organizations:

1. Association of Central Oklahoma Governments
2. Oklahoma Archaeological Survey
3. Oklahoma Historical Society, Administration
4. Oklahoma State Historic Preservation Office
5. Oklahoma Corporation Commission
6. City of Del City

7. Oklahoma County, District Two
8. Tinker AFB Community Advisory Board Members
9. City of Midwest City
10. Oklahoma Department of Environmental Quality, Customer Services Division
11. U.S. Army Corps of Engineers, Tulsa District, Planning and Environmental Division
12. City of Oklahoma City, Planning Department
13. Oklahoma Department of Transportation, Planning and Research Division
14. U.S. Army Corps of Engineers, Tulsa District, Regulatory Division
15. City of Oklahoma City, Ward Four
16. Oklahoma Department of Wildlife Conservation
17. U.S. Department of Agriculture, Natural Resources Conservation Service
18. Oklahoma DEQ Site Assessment Unit Community Action Board
19. Oklahoma Geologic Survey
20. U.S. Fish and Wildlife Services, Division of Ecological Services
21. EPA Region VI, Compliance Assurance Enforcement Division
22. USEPA-Region 6
23. Federal Emergency Management Agency
24. Oklahoma Water Resources Board, Planning and Management Division
25. Greater Oklahoma City Chamber of Commerce, Government Relations

A.4 COMMENTS RECEIVED ON THE DRAFT ENVIRONMENTAL ASSESSMENT

Two comment letters were received on the Draft EA (copies of these letters are included in this appendix):

- The Association of Central Oklahoma Governments, in a letter dated November 17, 2011, indicated that the project does not appear to be inconsistent with areawide goals and objectives. This comment is acknowledged.
- The State of Oklahoma Water Resources Board, in a notice dated November 21, 2011, recommends that the Local Floodplain Administrator be contacted for possible permit requirements for floodplain development. As stated in Subchapter 1.4.5 of this EA, the Air Force will obtain a Floodplain Development Permit from the Federal Emergency Management Agency for work in the 100-year floodplain.

DEPARTMENT OF THE AIR FORCE
72 AIR BASE WING (AFMC)
TINKER AIR FORCE BASE, OKLAHOMA

MEMORANDUM FOR OKLAHOMA ARCHEOLOGICAL SURVEY 17 October 2011
ATTN: MR. ROBERT L. BROOKS
111 EAST CHESAPEAKE
NORMAN, OK 73019

FROM: 72 CEG/CEAN
7701 Arnold Street Room 109
Tinker AFB, OK 73145-9100

SUBJECT: Prehistoric Resources Review of Section 15 T11N R2W, Section 21 T11N R2W, and Section 22 T11NR2W

1. Tinker AFB is requesting a review of prehistoric resources for the Replacement of JP8 Fuel Transfer Line and the Replacement of Type II Hydrant Fuel System projects at Tinker AFB, Oklahoma. The land to be reviewed is the Section 15 T11N R2W, Section 21 T11N R2W, and Section 22 T11N R2W. According to the Oklahoma State Historic Preservation Office, a review focusing on prehistoric resources by the Oklahoma Archeological Survey is required as part of the Section 106 review process. The review will be incorporated into the Environmental Assessment for the aforementioned projects.

2. Enclosed is a USGS Topography Map indicating the area of concern. For additional information, our point of contact is Mr. Tim Taylor at 739-7062.

Trudi Logan

TRUDI LOGAN, Chief
Environmental Engineering Operations Section
Environmental Management Division

Attachment: USGS Topography Map

Area of Concern

T 11 N

Oklahoma Archeological Survey

THE UNVERSITY OF OKLAHOMA

November 18, 2011

Mr. Tim Taylor
Department of the Air Force
72 Air Base Wing
7535 5th Street
Tinker Air Force Base, Oklahoma 73145-9100

Re: Tinker Air Force base proposed Replacement of JP8 Fuel Transfer Line and the Replacement of Type II Hydrant Fuel System. Legal Description: Section 15 T11N R2W, Section 21 T11N R2W, and Section 22 T11N R2W, Oklahoma County, Oklahoma.

Dear Mr. Taylor:

The Community Assistance Program staff of the Oklahoma Archeological Survey has reviewed the above referenced projects in order to identify potential areas that may contain prehistoric or historic archaeological materials (historic properties). The location of your projects has been crosschecked with the state files containing approximately 18,000 archaeological sites that are currently recorded for the state of Oklahoma. No sites are listed as occurring within the areas of the projects, and based on the topographic and hydrologic setting; no archaeological materials are likely to be encountered Thus an archaeological field inspection is not considered necessary. However, should construction activities expose buried archaeological materials such as chipped stone tools, pottery, bone, historic crockery, glass, metal items or building materials, this agency should be contacted immediately at (405) 325-7211. A member of our staff will be sent to evaluate the significance of these remains.

This environmental review and evaluation is performed in order to locate, record, and preserve Oklahoma's prehistoric and historic cultural heritage in cooperation with the State Historic Preservation Office. Oklahoma. Historical Society. In addition to our review comments, under 36CFR Part 800.3 you are reminded of your responsibility to consult with the appropriate Native American tribe/groups to identify any concerns they may have pertaining to this undertaking and potential impacts to properties of traditional and/or ceremonial value. Thank you.

Sincerely,

Janna Gruber
Staff Archaeologist

Robert L. Brooks
State Archaeologist

:ls

Cc: SHPO

Oklahoma Historical Society *Founded May 27, 1893*

State Historic Preservation Office
Oklahoma History Center • 2401 North Laird Ave. • Oklahoma City, OK 73105-7914
(405) 521-6249 • Fax (405) 522-0816 • www.okhistory.org/shpo/shpom.htm

November 21, 2011

Ms. Trudi Logan
Chief, Environmental Engineering Operations Section
72 ABW/CEAN
7535 5th Street
Tinker AFB, OK 73145-9100

RE: File #1352-11; Tinker AFB Proposed Project for Replacement of JP-8 Fuel Transfer Line and Type II Hydrant Fuel System

Dear Ms. Logan

We have received and reviewed the documentation concerning the referenced project in Oklahoma County. Additionally, we have examined the information contained in the Oklahoma Landmarks Inventory (OLI) files and other materials on historic resources available in our office. We find that there are no historic properties affected by the referenced project.

Thank you for the opportunity to comment on this project. We look forward to working with you in the future.

If you have any questions, please contact Charles Wallis, RPA, Historical Archaeologist, at 405/521-6381.

Should further correspondence pertaining to this project be necessary, the above underlined file number must be referenced. Thank you.

Sincerely,

Melvena Heisch
Deputy State Historic
Preservation Officer

MH:bh

association of central oklahoma governments

Thursday, November 17, 2011

Ms. Cindy Garrett
72 ABW/CEANO
7535 Fifth Street
Tinker AFB, OK 73145

RE: ID#K171101– Draft Environmental Assessment Add To and Alter Type III Hydrant Fueling System Tinker Air Force Base

Dear Ms. Garrett:

The Association of Central Oklahoma Governments has completed its Regional Clearinghouse Review of the above referenced proposal recently submitted by your office. Any future communication regarding this proposal should be accompanied by the ID number listed above.

As a result of our review process and comments received, the process and comments received, the proposed project, as of this date, does not appear to be inconsistent with areawide goals and objectives.

Please notify this office of any subsequent modifications, supplements, or amendments to this proposal if such occurs. At that point we will conduct an additional regional review of the modified proposal as necessary. You are also requested to notify this office of the official action taken on this proposal by the agency from which you are requesting assistance.

Please be advised that this letter is not a commitment of funds for your proposal from any funding source, but allows you to proceed with your application for funding consideration.

We appreciate this opportunity for review and comment on your proposal.

Sincerely,

21 E Main Street, Suite 100 Oklahoma City, OK 73104-2405 405 234 2264
FAX 234 2200 TTY 234 2217 www.acogok.org

John G. Johnson
Executive Director

21 E Main Street, Suite 100 Oklahoma City, OK 73104-2405 405 234 2264
FAX 234 2200 TTY 234 2217 www.acogok.org

J. D. STRONG
EXECUTIVE DIRECTOR

MARY FALLIN
GOVERNOR

STATE OF OKLAHOMA
WATER RESOURCES BOARD
www.owrb.ok.gov

OKLAHOMA WATER RESOURCES BOARD
Planning & Management Division
Oklahoma City, OK

PUBLIC NOTICE REVIEW

___ We have no comments to offer. _X_ We offer the following comments.

WE RECOMMEND THAT YOU CONTACT THE LOCAL FLOODPLAIN ADMINISTRATOR FOR POSSIBLE PERMIT REQUIREMENTS FOR THIS PROJECT. THE OWRB WEB SITE, www.owrb.ok.gov, contains a directory of floodplain administrators and is located under forms/floodplain management/floodplain administrators, listed alphabetically by name of community. **If this development would fall on STATE OWNED or operated property, a floodplain development permit is required from OWRB.** The Chapter 55 Rules and permit application for this requirement can be found on the OWRB web site listed above. If this project is proposed in a non-participating community, try to ensure that this project is completed so that it is reasonably safe from flooding and so that it does not flood adjacent property if at all possible.

Reviewer: Cathy Poage, CFM **Date:** 11/21/2011

Project Name: Proposed Replacement of Type III Hydrant Fuel System, Located at the 72nd Air Base Wing at Tinker Air Force Base, OK

FIRM Name: Dept. of the Air Force, Tinker AFB, Ms. Cindy Garrett

* Oklahoma County and Del City participate in the NFIP and have a floodplain development permitting system. Please see paragraph above.

PAID ADVERTISEMENT

NOTICE OF AVAILABILITY

DRAFT ENVIRONMENTAL ASSESSMENTS FOR THE PROPOSED REPLACEMENT OF THE TYPE III HYDRANT FUEL SYSTEM AND THE JP-8 FUEL TRANSFER LINE AT TINKER AFB, OKLAHOMA

The 72d Air Base Wing (ABW) of the U.S. Air Force, under command of Headquarters Air Force Materiel Command, is proposing two replacement projects that would support 552nd Air Control Wing (ACW), 76th Aircraft Maintenance Wing, and transient aircraft serviced north of the taxiways at Tinker Air Force Base (AFB), and multiple units and aircraft south of the crosswind runway:

Replacement of the Type III Hydrant Fuel System. The proposed replacement of the functionally limited existing Type III hydrant fuel system is needed to provide a reliable Type III hydrant fuel system that would: (1) eliminate congestion during the fueling and defueling process at the existing hydrant fuel system; (2) comply with Air Force facility requirements that necessitate a hydrant fuel system for aircraft with a total tank capacity exceeding 76,000 liters (20,000 gallons); and, (3) reduce the amount of time needed for fueling and defueling of aircraft at Tinker AFB.

Replacement of the Fuel Transfer Line. Approximately 11,000 linear feet of existing underground fiberglass fuel transfer line would be removed and replaced with an interior coated carbon steel pipe suitable for fuel. The diameter of the new pipeline would be the same as the existing fuel transfer line. The purpose of the action is to avoid failure of the pipeline. The replacement pipeline is needed to continue providing fuel to operating tanks that service aircraft under the responsibility of the Air Force and other agencies at Tinker AFB.

As part of the Air Force Environmental Impact Analysis Process, the Air Force has prepared Draft Environmental Assessments (DEAs) for these actions. Resources evaluated in the impact analyses include: air quality; biological resources; cultural resources; geology and soils; hazardous materials and wastes; and, water resources (wetlands and floodplains). The Air Force is considering approval of Findings of No Significant Impact and Findings of No Practicable Alternative for these actions. The DEAs are available at: the Metropolitan Library System Midwest City, 8143 E. Reno Avenue, Oklahoma City, OK 73110-7589. Should you have any comments on the DEAs, written comments may be mailed to:

72d Air Base Wing Public Affairs Office, ATTN: Brion Ockenfels
7460 Arnold Ave., Suite 127, Tinker Air Force Base, Oklahoma 73145
E-mail: brion.ockenfels@tinker.af.mil

All written comment letters must be received by **December 10, 2011.**
Should you have any questions, please contact Mr. Ockenfels at (405) 739-2027.

OC-ALC Strategic Goal 4. Improve mission readiness and support

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENTS FOR THE PROPOSED REPLACEMENT OF THE TYPE III HYDRANT FUEL SYSTEM AND THE JP-8 FUEL TRANSFER LINE AT TINKER AIR FORCE BASE, OKLAHOMA

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E-mail: brion.ockenfels@tinker.af.mil

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APPENDIX B

NATIVE AMERICAN CONSULTATION

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 72D AIR BASE WING (AFMC)
TINKER AIR FORCE BASE OKLAHOMA

MEMORANDUM FOR ATTACHED DISTRIBUTION LIST 7 October 13, 2011

FROM: 72 ABW/CE
7535 Fifth Street, Building 400
Tinker AFB, OK 73145

SUBJECT: Notification of Replacement of Type II Hydrant Fuel System at Tinker Air Force Base

In accordance with the National Historic Preservation Act of 1966, as amended, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act of 1990, we are notifying you of a proposed construction project on Tinker AFB, Oklahoma. The U.S. Air Force is preparing an Environmental Assessment (EA) for the proposed replacement of the Type III Hydrant Fuel System at Tinker AFB (the Draft EA will be available later this year). The project would require construction at the existing fuels compound near the taxiways on the Base. The Air Force would replace the functionally limited existing hydrant fueling system with a JP-8 Type III hydrant fueling system that would serve twenty-three (23) aircraft parking positions. The new system would have a standard Type III pump house with pumps and filter separators, control system, and receipt filtration. The Air Force would also refurbish two 420,000-gallon fuel tanks, product recovery system, surge suppressor pit, fuel dispensing looped system, and spill containment at the hydrant service vehicle checkout stands. The project would also include the replacement of all piping, and the demolition of ramp pavement and a pump house to efficiently provide and convey clean, dry fuel to fueling points in support of ongoing aircraft operations.

To ensure that any areas of sacred or spiritual significance to Native American groups are considered, we would appreciate your help in identifying any interests or concerns regarding traditional resources or properties within the lands associated with proposed construction activities. If you have concerns with this proposed action, you may address any comments or questions to Ms. Cindy Garrett via email at Cynthia.Garrett@tinker.af.mil or by mailing your written response to: Cindy Garrett, USAF 72ABW/CEAN, 7535 Fifth Street, Suite 204, Tinker Air Force Base, OK 73145. She can be reached by phone at (405) 734-2097. Please provide any comments or information within 30 days from the date of the letter. Thank you for your interest in the project.

THOMAS M. GRIFFITH
Base Civil Engineer

Attachments: 1. Project Location
2. Distribution List

Figure 1. Location of Proposed Action at Tinker AFB

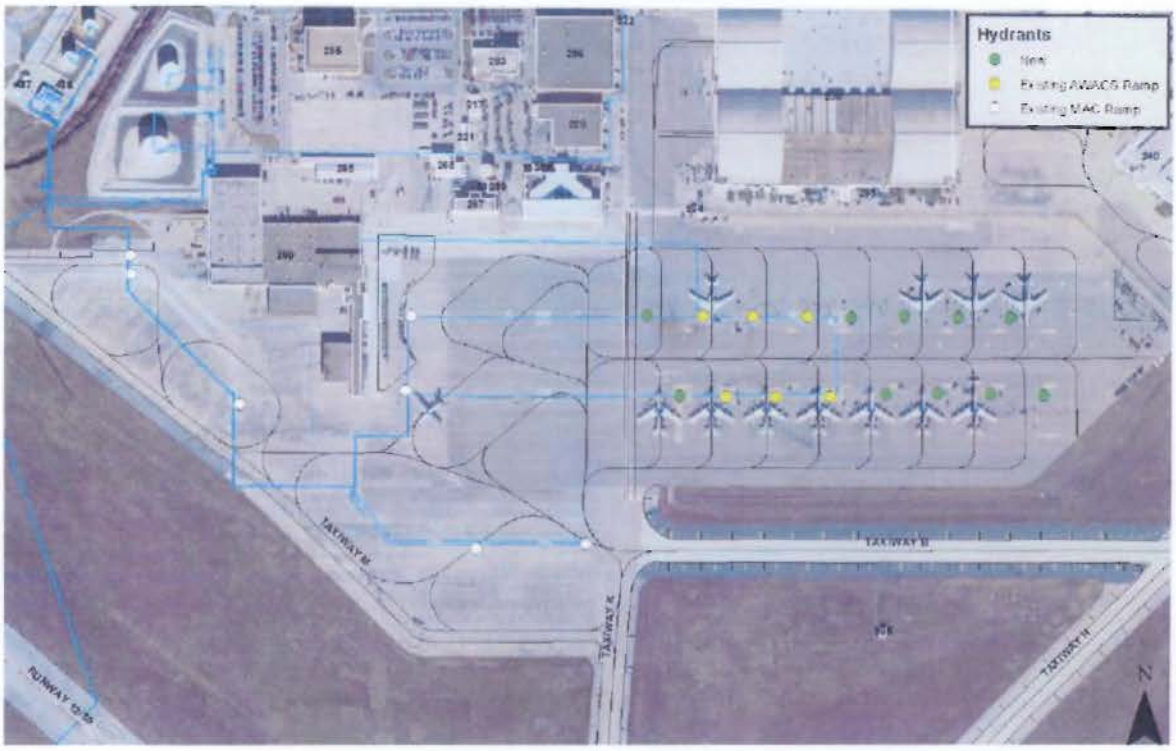

Figure 2. Location of Proposed Type III Hydrant Fuel System Replacement at Tinker AFB, Oklahoma

Distribution List

Seminole Nation
Principal Chief Leonard Harjo
P.O. Box 1498
Wewoka, OK 74884
(405) 257-7200

Muscogee (Creek) Nation
Principal Chief A.D. Ellis
P.O. Box 580
Okmulgee, OK 74447
(918) 732-7731

Caddo Nation of Oklahoma
Caddo National Chairman,
Brenda Shemayme Edwards
P.O. Box 487
Binger, OK 73009
(405) 656-2344

Osage Nation
Principal Chief John Red Eagle
P.O. Box 779
Pawhuska, OK 74056
(918) 287-5555

Wichita and Affiliated Tribes
Stratford Williams, President
P.O. Box 729
Anadarko, OK 73005
(405) 247-2425